DOCUMENT RESUME

ED 153 185 CS 004 022

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TITLE Validation of the Effectiveness of the Learning Center Approach to Skill Instruction. Technical Report No. 384.
INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Cognitive Learning.
SPONS AGENCY Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.; National Inst. of Education (DHEW), Washington, D.C.
PUB DATE Aug 76
CONTRACT NE-C-00-3-0065
NOTE 74p.

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS *Autoinstructional Methods; Elementary Education; Grade 4; *Individualized Instruction; *Learning Laboratories; *Reading Instruction; *Reading Research; *Reading Skills; Skill Centers

ABSTRACT

Alternative methods for facilitating mastery of reading skills must be provided if instruction is to become differentiated and truly individualized. As part of a study to find alternative methods in reading instruction, 45 fourth graders were pretested for mastery of one skill within the Wisconsin Design for Reading Skill Development, and the 44 students who did not show skill mastery were assigned to one of two instructional groups. One group received skill instruction through a teacher-directed approach while the other group received skill instruction in a learning center situation. Posttest scores show no significant differences between the two groups, leading to the conclusion that the learning center approach could be an alternative to teacher-directed instruction. (Appendixes provide the skills tests that were used in the study, sources of instructional materials, teacher's plans, worksheets, games, transparencies, and an activity check list.) (RI)

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Technical Report No. 384

VALIDATION OF THE EFFECTIVENESS OF THE LEARNING CENTER APPROACH TO SKILL INSTRUCTION

by

Sandra White

Report from the Project on
Conditions of School Learning and
Instructional Strategies

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August 1976

CS004022

ED127182

Published by the Wisconsin Research and Development Center for Cognitive Learning, supported in part as a research and development center by funds from the National Institute of Education, Department of Health, Education, and Welfare. The opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education and no official endorsement by that agency should be inferred.

Center Contract No. NE-C-00-3-0065

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The Wisconsin R&D Center is supported with funds from the National Institute of Education; the Bureau of Education for the Handicapped, U.S. Office of Education; and the University of Wisconsin.

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I

INTRODUCTION

PURPOSE

The purpose of this study was to investigate the learning center approach as an effective means of instructing one skill from the Study Skills element of the Wisconsin Design for Reading Skill Development.

RATIONALE

The Wisconsin Design for Reading Skill Development (the Design) is a skill-based approach to reading instruction. Its main objective is "to expedite individually guided education in reading skill development at the elementary school level" (Otto & Askov, 1970). Six skill areas have been identified. The skills within each area have been arranged in seven levels (A-G) which correspond approximately to grade levels K-6. The six skill elements are: Word Attack, Comprehension, Study Skills, Self-Directed Reading, Interpretive Reading, and Creative Reading. Closed behavioral objectives have been written for each skill in the areas of Word Attack, Comprehension, and Study Skills. Specific prescriptive objectives were not written for the skills in the last three areas, Self-Directed Reading, Interpretive Reading, and Creative Reading, which are defined in terms of open, or descriptive, objectives.

Through the identification of reading skills and through the provision of a management system for instructing for skill mastery, the Design helps the teacher facilitate individualization in the classroom. In addition, the Design is based on the assumption that individualization is most realistically attained when instruction is focused and differentiated. Otto (1975) describes focused instruction in terms of three basic steps: (1) decide what the learner must know, (2) find out what the learner does and does not know, and (3) teach the learner what he doesn't already know. After steps one and two have been accomplished, instruction in the skills the learner does not know can be differentiated by combining one-to-one, small group, and large group situations in one classroom.

If reading instruction is to be differentiated, alternative methods of instruction are needed. This need for alternative methods, in addition to the teacher-directed approach, is apparent when one considers the number of skills that must be taught within each element of the Design. The Word Attack element has approximately 45 objectives which are divided into four levels. The Study Skills element has approximately 71 objectives which are divided into seven levels. The Comprehension element was still in the process of development at the time of this study. If the teacher is to facilitate the mastery of as many reading skills as possible at a given level, and if s/he is to strive for more individualization within

his or her classroom, then s/he must have viable alternative methods of reading skill instruction. One of the alternative methods of reading skill instruction that might facilitate differentiated, focused instruction is the learning center approach. If the learning center approach is as effective as the teacher-directed approach in the instruction of one skill, then the teacher will have an alternative method which might be used to teach this skill. The utilization of the learning center method for instruction of this skill will allow the teacher to give more class time to students or to skills that require more teacher guidance or instruction. Wallen (1973) emphasizes this need for alternative approaches to skill instruction and explains how a classroom can be organized for differentiated instruction:

> Two completely different types of groups might be organized. The teacher groups for direct instruction when she teaches individuals and small groups for the specific performance objectives that are appropriate for them. She groups for independent activities when she has children doing things that require little or no direct teacher attention. Both kinds of groups operate simultaneously. While the teacher is directly instructing an individual or small group, the rest of the children are engaged in independent activities [p. 257].

Therefore, in this study, the learning center approach was investigated to determine its effectiveness as an alternative method to skill instruction and as a step toward achieving differentiated, focused instruction.

REVIEW OF THE LITERATURE

The learning center approach is an approach to learning and classroom organization which encourages and facilitates independence in learning. McGrath (1971) described learning centers in terms of five characteristics:

1. The instructional design is based on a variety of both audio and visual learning activities.

2. Resources in a center include non-print as well as print resources.

3. The student activities are independent learning experiences.

4. The facilities provide independent learning through audio and visual experiences.

5. The curriculum of the learning center is integrated into the total instructional program. [p. 2]

Hanson (1971) also emphasizes the importance of integrating the learning center into the instructional program:

> Learning centers are areas in the classroom where children work independently at learning activities which they have selected or the teacher has assigned to them. They are not places where children go when they have finished their work. They are places where children do their work [p. 3].

As a part of the instructional program, the learning center may be used for a variety of different purposes. Based on these purposes, Greff and Askov (1974) specify two types of centers: (1) a skill center is designed by the teacher who designates a specific objective to be met and evaluates mastery of that objective; (2) an interest center allows the student to set his own task and choose his own materials. The way in which centers are used for instruction will vary from classroom to classroom. Some teachers use learning centers for a specific period of time each day. Children may select the center while the teacher, as helper and resource person, moves from one station to another. In this way, a center is used as a supplement to regular instruction. Other teachers may use the center as the primary mode of instruction in which the teacher uses individual or small group techniques to ensure that children are learning the necessary skills. The way centers are used should depend on individual students. Greff and Askov (1974) state that individual differences must be considered when one organizes a learning center classroom:

> Centers can sometimes serve as a substitute for instruction for some students, while for others they may best be used as a supplement to reinforce what is first taught by the teacher. . . . Centers can help the teacher reduce the amount of direct contact, especially for those students who are capable of working well independently [p. 4].

Very little empirical research has been attempted to determine the effectiveness of a learning center approach to reading skill instruction. Naylor (1971) did an evaluative study of the effectiveness of a multi-station program which was employed in a classroom for reading instruction for one year. Stations in this program provided opportunity for group discussion, oral reading, individual study, specific skill instruction, and individual pupil-teacher conferences. Various modes of learning and different types of media and materials were included in this approach. Self-instruction and self-correction helped to increase student involvement. Reading instruction through learning centers was scheduled for one hour per day. Ongoing evaluation was accomplished through teacher observation, student daily progress, student-teacher conferences, and formal evaluations. Comparisons of individual grade equivalent scores on the Iowa Tests of Basic Skills (Hieronymus, & Lindquist, et al, 1964) for fall 1968 and fall 1969 were used to evaluate the program. Vocabulary development changes were positive for 96 percent of the students. In addition to these achievement comparisons, attitudes were subjectively assessed. Through student comments and an attitude survey, students showed a preference for this type of reading experience. There was a noticeable lack of discipline problems and an increase in peer assistance and self-reliance.

The teachers also showed positive attitudes toward this type of reading instruction. Even though Naylor evaluated the effectiveness of the center approach in the classroom, she did not compare this approach to any other method. Such a comparison was made in this study.

SCOPE OF THIS STUDY

This study focused on one main concern: the effectiveness of a learning center approach as compared to the effectiveness of the teacher-directed approach in the instruction of one skill from the Study Skills element of the Design. Students' posttest scores on Level D and Level F subtests of the Study Skills tests from the Wisconsin Tests for Reading Skill Development (Kamm, Stewart, & Van Blaricom, 1973) were compared to determine the effectiveness of the two approaches.

HYPOTHESIS

There will be no significant difference between the post-treatment performance of students in a teacher-directed group and the post-treatment performance of students in a learning center group.

II

PROCEDURE

DEFINITION OF TERMS

For the purposes of this study, the teacher-directed approach and the learning center approach need to be defined in terms of student and teacher responsibilities. The teacher-directed approach is an approach to learning in which the teacher presents the material and activities to a group. The students work on activities individually with teacher supervision. The teacher-directed approach in this study, consisted of instruction through teacher presentations and teacher direction of all activities. The teacher corrected or helped with the correction of all work. The teacher in the teacher-directed approach accepts the majority of the responsibility for directing skill learning.

The teacher who utilizes the learning center approach organizes the classroom for independent learning. In this study, the learning center consisted of a variety of learning stations. Each learning station had one or two activities that would help facilitate the learning of the skill. The teacher in this situation acted as a resource person and moved from one station to another offering incidental instruction to anyone who needed it. The activities for each station were designed to be self-instructing and self-correcting. The student in the learning center approach accepts the majority of the responsibility for his own skill learning.

SUBJECTS

The subjects of this study were 45 fourth grade students from a small rural community in northern Wisconsin. Fourth grade students were chosen because the investigator felt that students at this level would be capable of working independently in a learning center situation. In addition, many fourth grade teachers still use the Design Word Attack element to help students who did not master all of the Level D skills in third grade. If these teachers decide to implement Study Skills or Comprehension or both in addition to the Word Attack element, they will encounter a number of skills and objectives. Therefore, an alternative approach to skill instruction might be most beneficial to teachers at this level.

The subjects were from two fourth grade classrooms in which the students were heterogeneously grouped. The Design Word Attack element was used in these classrooms for reading skill development. The Study

Skills element was not used. Therefore, the subjects were familiar with the Design procedures from the Word Attack element, but had had no prior instruction in the study skill chosen for this study.

INSTRUMENTS

Study Skill 1 from the Representation Strand, "Map Symbols," (Chester, Askov, & Otto, 1973) was chosen as the skill to assess and instruct. The criterion-referenced subtests from two levels of the Study Skills element of the Wisconsin Tests for Reading Skill Development were used to determine students' knowledge and understanding of the skill prior to instruction and to assess students' learning after instruction. The Level D subtest was given in addition to the fourth grade Level E subtest. Because the students had not had instruction in any of the Study Skills, the subtest for both levels was given to obtain a more accurate estimate of each student's level of skill development. The same subtests for Skill 1 were used for pretesting and posttesting. The reliabilities of the two subtests had been determined prior to this study. The reliability coefficient of Skill 1 subtest for Level D is .77. The reliability coefficient of Skill 1 subtest for Level E is .72. Examples of the two tests are given in Appendix A.

INSTRUCTIONAL MATERIALS

The same instructional materials and activities were used in both groups. Activities from Levels C, D, and E were included to give children sufficient background in the skill. The activities were divided into four areas: (1) Introductory Activities, (2) Level C Activities, (3) Level D Activities, and (4) Level E Activities. An objective, tape recorded or written instructions, necessary materials, and an answer key (if needed) accompanied each learning station activity for the learning center group. Both groups were involved in the following types of activities:

1. listening to tape recorded readings
2. reading sections of books
3. viewing filmstrips
4. doing worksheets
5. playing games
6. looking at transparencies
7. making maps

Sources of the instructional activities and materials are given in Appendix B. The teacher's lesson plans, the worksheets, games, and transparencies for both groups are found in Appendix C.

DESIGN OF THE STUDY AND DATA-COLLECTION PLAN

The subtests for Skill 1 for Levels D and E were administered to the subjects. Non-masters of both tests were the subjects for this study. Forty-four of the 45 students in the two fourth grades were determined to be non-masters. These 44 subjects were assigned randomly to one of the two groups. Instructional activities were developed to teach the objective. Activities were the same for both groups. The subjects in the teacher-directed group were instructed by one fourth grade teacher in one room. The subjects in the learning center group worked in another room under the supervision of the other fourth grade teacher. Instruction for both groups was for 45 minutes a day for three days a week for three weeks.

The teacher in the teacher-directed group instructed the activities in order as listed in the teacher's lesson plans (see Appendix C). Most of the instruction was done in large groups; all instruction was under constant teacher direction.

The teacher in the learning center group acted as a helper or resource person. Each lesson began with the introduction and explanation of the new stations that were added periodically to the learning center. Not all of the stations were available to the subjects at one time. As the subjects began to complete the tasks at one level, stations for another level were added. Therefore, the subjects were given the opportunity to choose activities from one or two levels. Unlike the subjects in the teacher-directed group, these subjects did not do all the activities in the same order. An example of the activity check sheet that was used to help each subject and the teacher know what activities had been completed is found in Appendix D. In addition to this management device, a wall chart was also used. The names of the subjects were written on the side, and the activities were listed across the top. Subjects recorded the activities on the chart as they completed them. This chart helped the teacher regulate the number of subjects in the stations.

At the conclusion of the three week instructional period, the same subtests for Skill 1 for Levels D and E were administered to the subjects in both groups.

DATA ANALYSIS PLAN

The pretest scores were analyzed with a two-sample independent t-test to determine if there was any significant difference between the two groups before instruction. To determine if significant gains were made by both groups as a result of instruction, the data were analyzed with a dependent t-test. The significance level was set at $p < .05$. The posttest scores were analyzed with a two-sample independent t-test to determine if there was a significant difference between the two groups after instruction. The significance level was set at $p < .05$. The power of the independent t-test was determined at .87.

ASSUMPTIONS AND LIMITATIONS

The two-sample independent t-test was used in the statistical analysis. In this test, it is assumed that the scores are independent. However,

because of the nature of this study, this assumption may have been violated. As a result of the instructional process, teacher-student interaction and student-student interaction may have had an effect on subjects' scores.

The teacher variable was not controlled in this study. This limits the conclusions that may be made from the data. One teacher worked with the teacher-directed group, and a different teacher acted as the resource person in the learning center group. The personalities and teaching mannerisms of the two teachers may have affected the results.

Another limitation of this study is found in the testing procedure. Because the same tests were used for both pretesting and posttesting, the interpretation of the results was limited by the learning that occurs through test taking. However, this is the recommended procedure of the Design Study Skills element at this time for the Representation Skills.

Even though random assignment of subjects to the groups was part of the design, the investigator had no guarantee that the groups were equal in the ability to learn the study skill. Likewise, one cannot generalize the interpretation of the results to all children. Each child learns differently, and while one method works for one child, it may not work for another.

In addition, interpretation of the results cannot be generalized to another skill. This study looked at just Skill 1 of the Representation Strand of the Study Skills element. Testing and instructing another skill might produce different results.

III

RESULTS

DATA ANALYSIS

The pretest scores were analyzed with the two-sample independent t-test to check the equality of the groups. There were no significant differences at a .05 significance level between the two groups on either Level D or Level E pretest scores.

In the teacher-directed group, there were five masters on the Level D posttest and nine masters on the Level E posttest. In the learning center group, there were three masters on the Level D posttest and eight masters on the Level E posttest. The pretest and posttest scores for both groups were analyzed with a dependent t-test to determine if significant gains were made by both groups. Significant gains were made by both groups as a result of instruction as shown by both Level D and Level E posttest scores. Pretest and posttest means, standard deviations, and resulting t-values for both groups are given in Table 1.

The posttest scores were analyzed with the two-sample independent t-test to test the hypothesis: There will be no significant difference between the post-treatment performance of students in a teacher-directed group and the post-treatment performance of students in a learning center group. There was no significant difference at a .05 level between the two groups on both Level D and Level E posttest scores. The means, standard deviations, and t-values for both groups on both levels of the tests are reported in Table 2.

DISCUSSION AND CONCLUSIONS

Although the investigator was interested only in comparing the two approaches, one must consider the low means for both groups. There were very few masters on either of the tests in either group. However, even though there were few masters on the tests, significant gains were made by both groups. These students had not been instructed in any of the study skills prior to this study. This might give some explanation for the small number of masters after instruction. In addition, as a result of further field tests, the recommended break-in testing level for fourth-grade students has been changed to Level C rather than Level D or E. The concepts in the Level D and Level E subtests may have been too difficult for these fourth grade students who had had no prior work with this skill. Because of these low scores on the posttests, the generalizations that might be made from the data are limited.

TABLE 1

PRETEST AND POSTTEST MEANS, STANDARD DEVIATIONS, AND t-VALUES FOR THE TWO INSTRUCTIONAL GROUPS ON LEVEL D AND LEVEL E SUBTESTS

	d.f.	Means	S.D.	t-values
Level D				
TD Group[a]				
Pretest	21	8.05	2.94	3.32*
Posttest	21	10.05	2.90	
LC Group[b]				
Pretest	21	7.23	3.32	3.14*
Posttest	21	8.91	3.58	
Level E				
TD Group				
Pretest	21	7.50	3.32	1.92*
Posttest	21	10.27	2.86	
LC Group				
Pretest	21	7.27	3.74	3.13*
Posttest	21	9.41	3.87	

*Significant at $p < .05$ level

[a]TD--Teacher-Directed

[b]LC--Learning Center

TABLE 2

MEANS, STANDARD DEVIATIONS, AND t-VALUES BASED ON LEVEL D AND LEVEL E POSTTEST SCORES FOR THE TWO INSTRUCTIONAL GROUPS

	d.f.	Means	S.D.	t-values
Level D				
TD Group[a]	21	10.05	2.90	
LC Group[b]	21	8.91	3.58	$t = 1.166$
Level E				
TD Group	21	10.27	2.86	
LC Group	21	9.41	3.87	$t = .843$

Note: t-values are not significant based on $p < .05$

[a] TD--Teacher-Directed

[b] LC--Learning Center

In addition, some interesting information was obtained through a discussion with the teachers. The teacher in the teacher-directed group did not have time to teach all of the activities at Level E. However, before the end of the three week instructional period, some of the students in the learning center group needed more activities beyond the Level E activities. This suggests that some students would have been detained by the structured format of the first approach when they might have been able to complete the work more quickly on their own. The teacher who worked with the learning center group pointed out two main problems with this method of instruction: (1) some students had trouble reading the directions in the stations. and (2) some of the students needed more help than others. Because of these concerns, one cannot conclude that one approach will be effective for all children. Each child is an individual, and each one learns in his or her own way.

IMPLICATIONS

Even though there are many limitations, the results of this study give some indication that the teacher who uses the Design Study Skills element has an alternative approach to teaching Study Skill 1 of the Representation Strand at Levels D and E. The teacher could use the learning center for instruction of this skill while s/he works with children or with another skill that requires more teacher direction. In addition, the learning center might be used as an alternative with those students who learn better independently. While these children are working on their own on a skill in the center, other children who need more direct help could be working on the same skill with the teacher.

If alternative methods of skill instruction are used, instruction will be focused and differentiated. Through diagnosis, the teacher learns what approach works best for each child. Then, the teacher begins to use a variety of approaches so that the child is offered the opportunity to learn the way that will work best for him or her. Through focusing and differentiating instruction, individualized reading can become a reality.

RECOMMENDATIONS FOR FUTURE RESEARCH

There are still many questions that need to be answered when one considers the learning center approach as an effective means of instruction in the classroom. Control of the teacher variable in future studies should be considered when evaluating the effectiveness of the approach. Further research could determine what skills in the Design elements could be taught effectively through a learning center situation.

Even after all the research is done, one must still consider each student and how s/he learns. No one method will work for all children. However, if several ways to learn a skill are made available to the student, s/he has a better chance of finding a way that will help him or her achieve success. Therefore, the research on the effectiveness of the learning center may be one step toward differentiating instruction to facilitate learning for each child.

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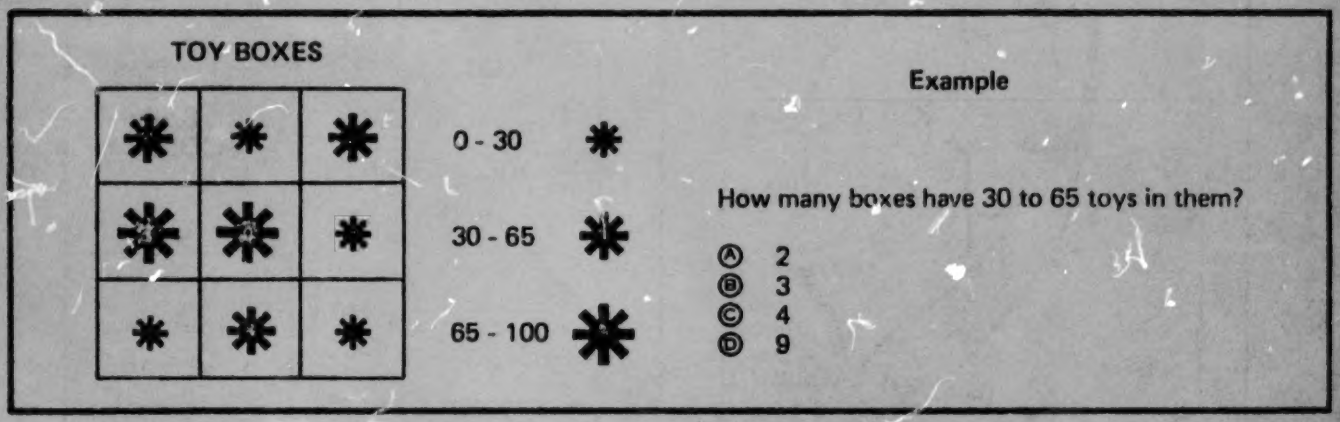
APPENDIX A

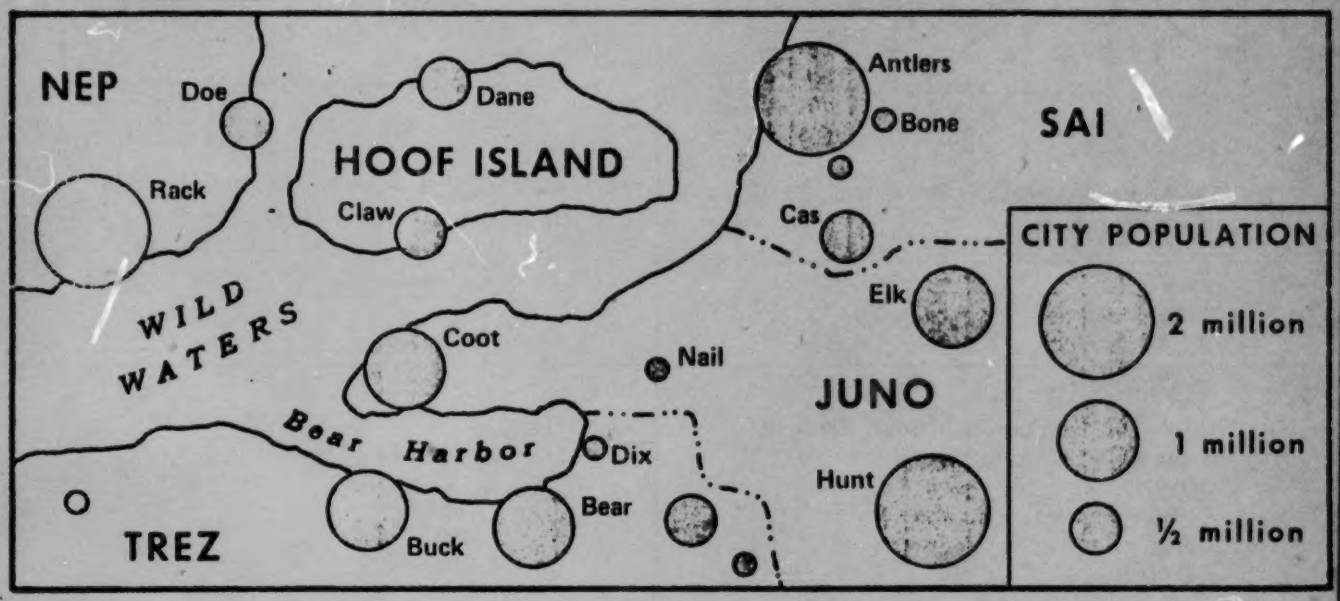
STUDY SKILLS SUBTESTS FOR

LEVEL D AND LEVEL E

17

Test 1
Point and Line Symbols





1. How many people live on Hoof Island?

   Ⓐ less than ½ million
   Ⓑ ½ million
   Ⓒ 1 million
   Ⓓ 2 million

2. Which country has exactly 2½ million people living in it?

   Ⓐ Trez
   Ⓑ Juno
   Ⓒ Sai
   Ⓓ Nep

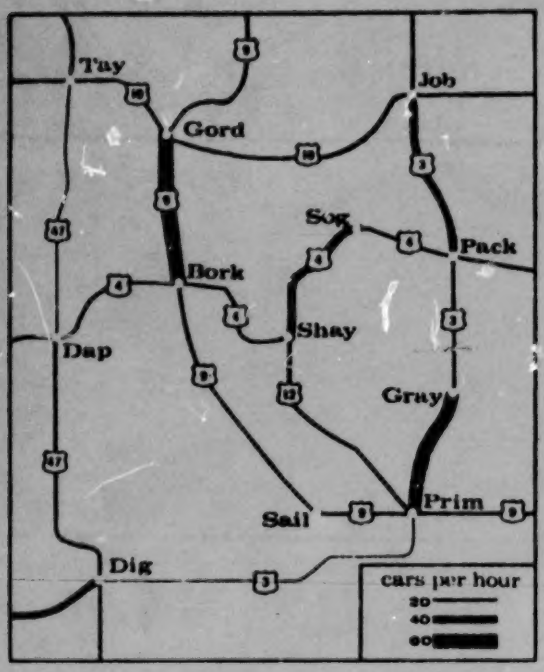
3. How many people live around Bear Harbor?

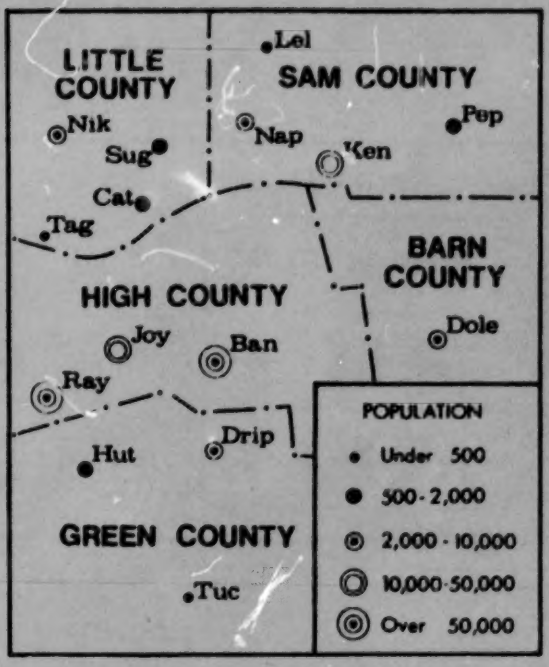
   Ⓐ a little over 1½ million
   Ⓑ exactly 3 million
   Ⓒ a little over 3 million
   Ⓓ exactly 4 million

4. How many people live in Bone, a suburb of Antlers?

   Ⓐ less than ½ million
   Ⓑ ½ million
   Ⓒ 1 million
   Ⓓ 2 million

18





5. On how many sections of highway do 60 cars per hour travel?

Ⓐ 2
Ⓑ 3
Ⓒ 4
Ⓓ 6

6. How many cars per hour travel [illegible] between Pack and Sog?

Ⓐ less than 20
Ⓑ 20
Ⓒ 40
Ⓓ 60

7. On how many sections of highway do 40 cars per hour travel?

Ⓐ 2
Ⓑ 3
Ⓒ 4
Ⓓ 6

8. How many cars per hour travel between Dig and Prim?

Ⓐ less than 20
Ⓑ 20
Ⓒ 40
Ⓓ 60

9. How many cities in Green County have a population of over 50,000?

Ⓐ 0
Ⓑ 1
Ⓒ 2
Ⓓ 3

10. Which of the following could be the population of Drip?

Ⓐ 475
Ⓑ 1,504
Ⓒ 5,784
Ⓓ 49,121

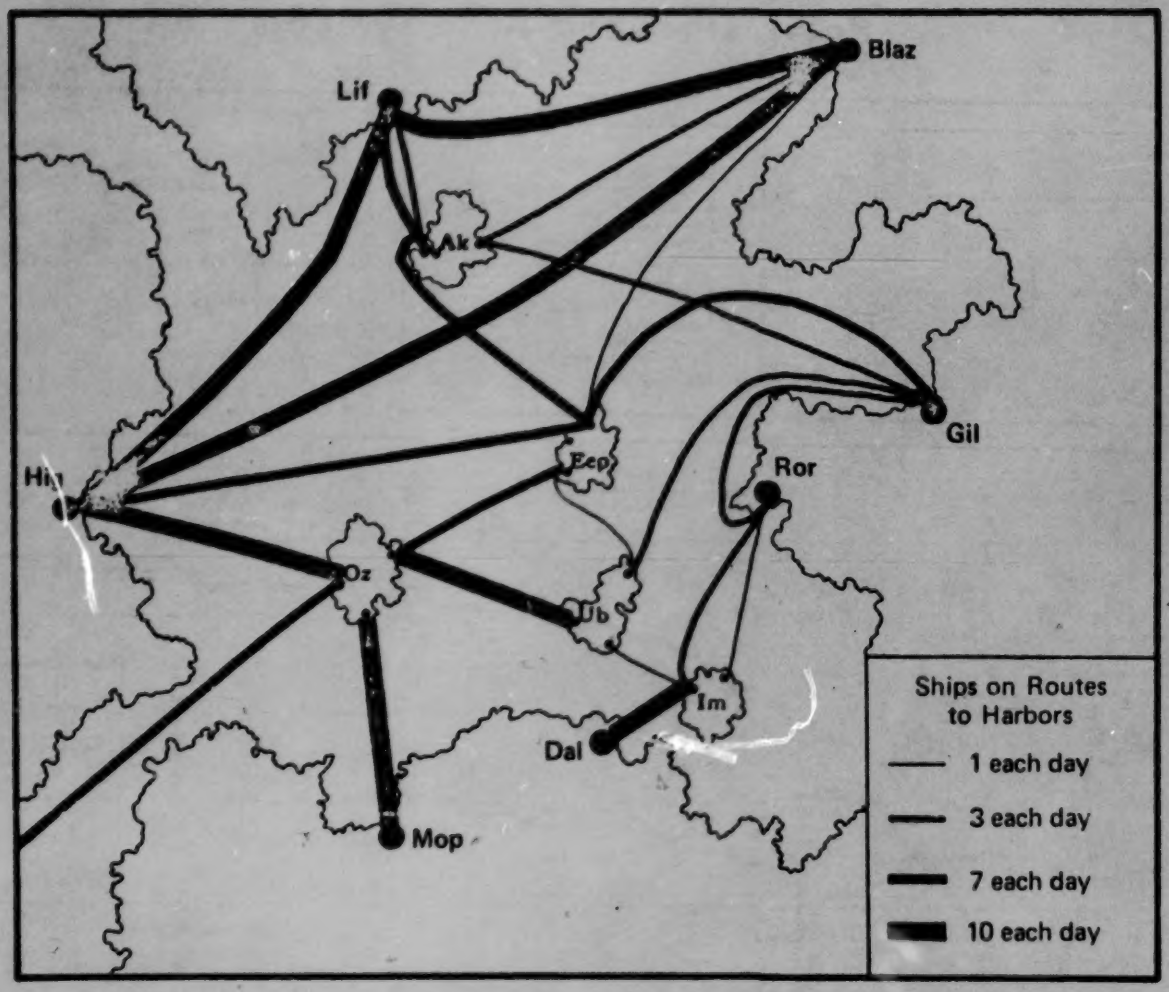
11. Which of the following could be the population of the smallest city in High County?

Ⓐ 450
Ⓑ 9,803
Ⓒ 31,542
Ⓓ 51,612

12. A city in Sam County has 1,643 people. Which city is this?

Ⓐ Ken
Ⓑ Lel
Ⓒ Nap
Ⓓ Pep

GO ON TO THE NEXT PAGE ▶



13. How many boats travel each day from Lif to Ak?

Ⓐ 3
Ⓑ 7
Ⓒ 10
Ⓓ 25
Ⓔ 30

14. Which island has the most ships entering its harbors?

Ⓐ Ak
Ⓑ Eep
Ⓒ Im
Ⓓ Oz
Ⓔ Ub

15. Which mainland city has the least busy harbor?

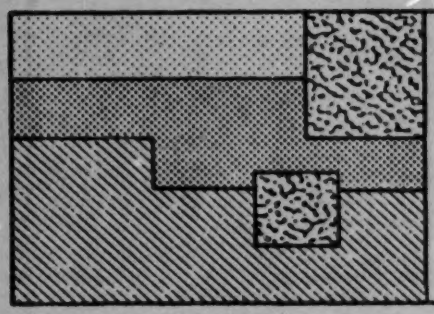
Ⓐ Blaz
Ⓑ Dal
Ⓒ Gil
Ⓓ Hig
Ⓔ Lif
Ⓕ Mop
Ⓖ Ror

16. Joan decided to travel directly from Ak to Blaz. If she missed the first two boats, how many more chances would she have to catch a boat the same day?

Ⓐ 0
Ⓑ 1
Ⓒ 5
Ⓓ 8

STOP

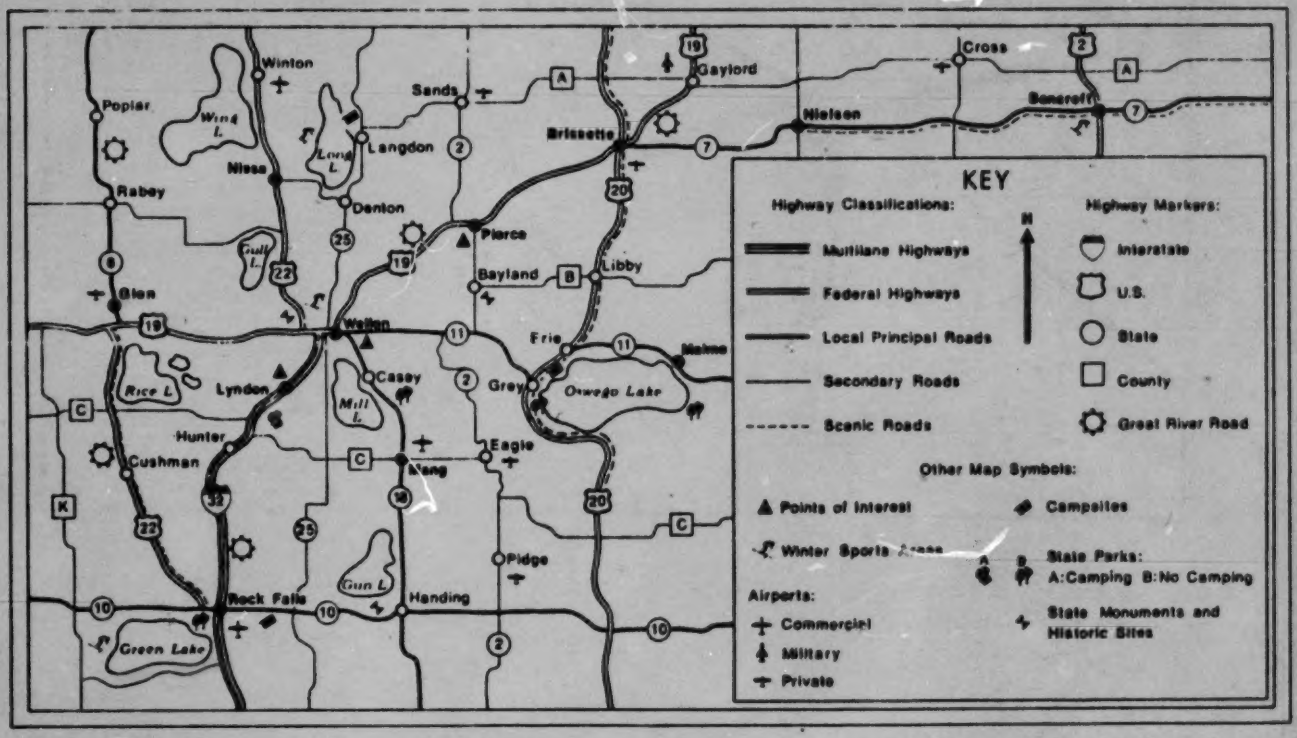
Test 1
Point, Line, and Area Symbols



Example

What is most of the land area used for?

A. apartments
B. farms
C. houses
D. motels



1. Near Gun Lake (south of Wellen) there is a
   - A. Point of Interest
   - B. Winter Sports Area
   - C. Campsite
   - D. State Park: Camping
   - E. State Park: No Camping
   - F. Historic Site

2. What type of highway is Route 20?
   - A. Interstate
   - B. U.S.
   - C. State
   - D. County
   - E. Great River Road

3. Near what town is the State Park with camping?
   - A. Casey
   - B. Grey
   - C. Langdon
   - D. Lyndon
   - E. Malmo
   - F. Rock Falls

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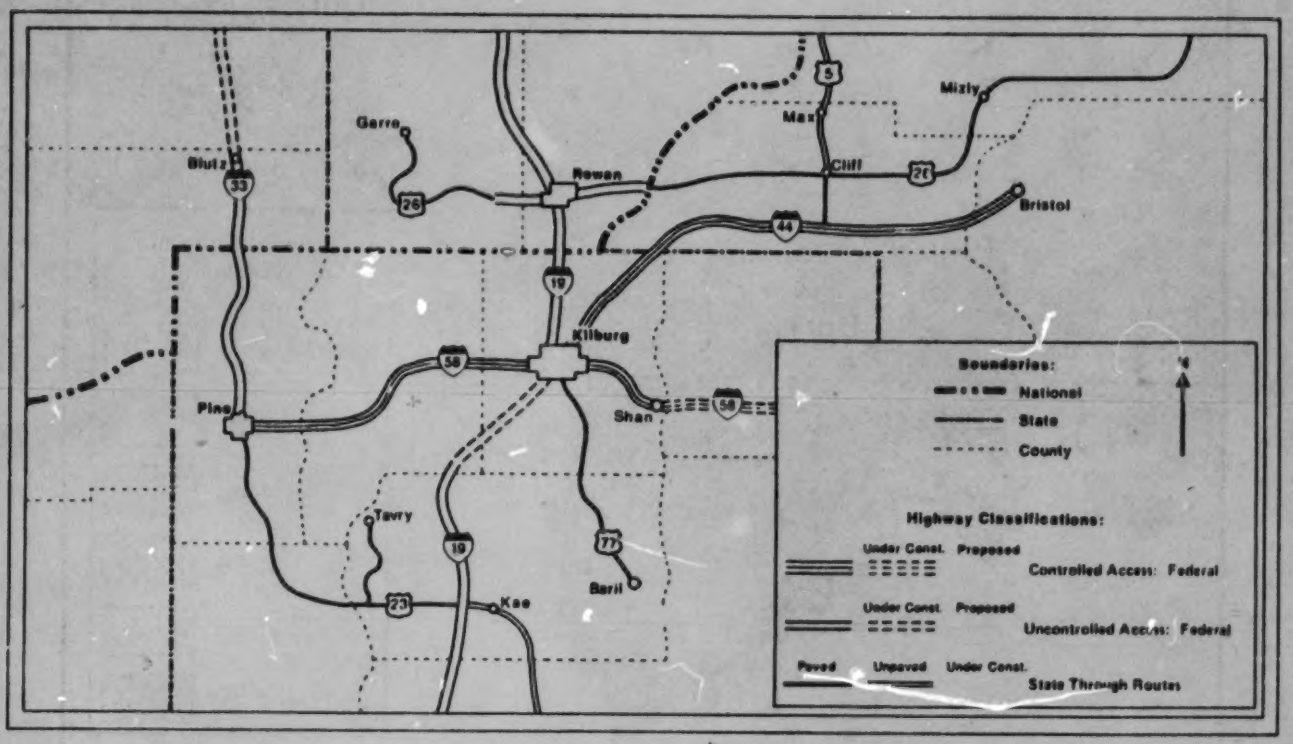
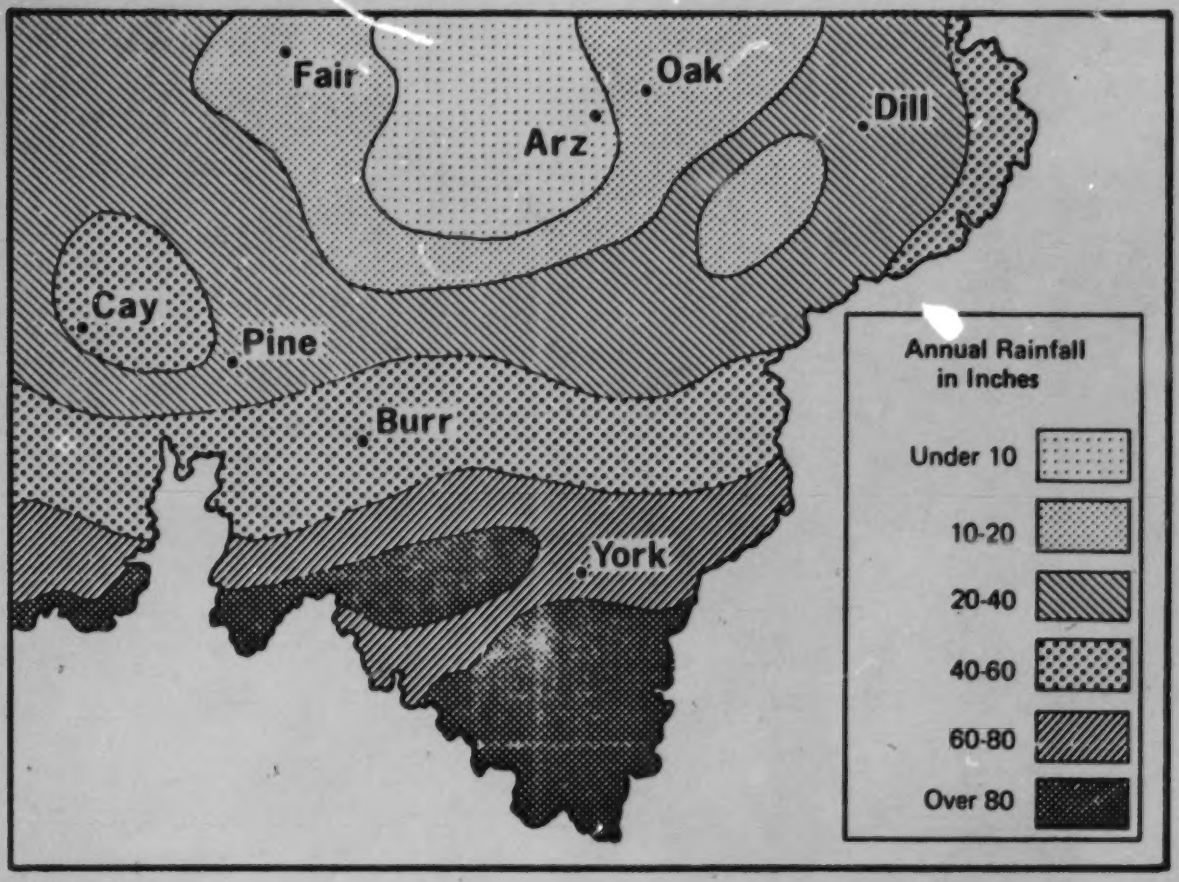


4. Which road in the northern half of the map is unpaved?
   - A. 5 north of Cliff
   - B. 19 north of Kliburg
   - C. 26 north of Garre
   - D. 33 north of Blutz
   - E. 44 east of Bristol

5. Which State Through Route is under construction?
   - A. 5 north of Cliff
   - B. 19 south of Kliburg
   - C. 26 north of Garre
   - D. 33 north of Blutz
   - E. 58 west of Pine
   - F. 58 east of Shan

6. Baril and Tavry are in the same
   - A. country only
   - B. country and state only
   - C. country, state, and county



7. Which city is driest?
   A. Arz
   B. Burr
   C. Cay
   D. Dill
   E. Fair
   F. Oak
   G. Pine
   H. York

8. How many areas get over 80 inches of rainfall?
   A. 1
   B. 2
   C. 3
   D. 4

9. Which two cities get 40-60 inches of rainfall?
   A. Oak and Fair
   B. Oak and Arz
   C. Dill and Pine
   D. Cay and Pine
   E. Cay and Burr

10. In which city would it be most likely to rain every day of the year?
    A. Arz
    B. Burr
    C. Cay
    D. Dill
    E. Fair
    F. Oak
    G. Pine
    H. York

11. How many *other* areas get the same amount of rainfall as the area Oak is in?
    A. 1
    B. 2
    C. 3
    D. 4

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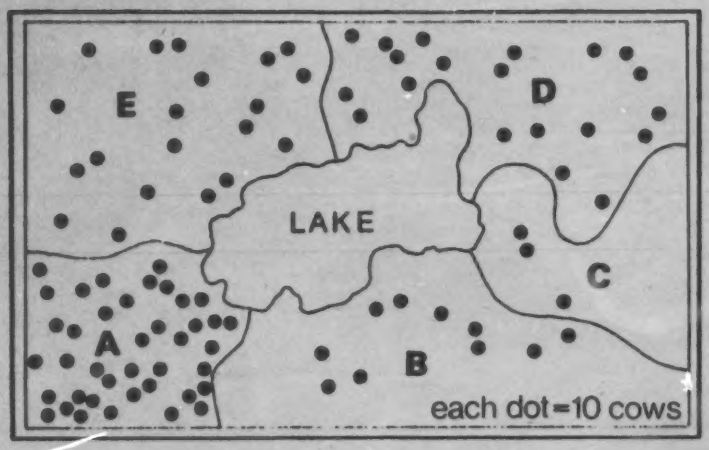
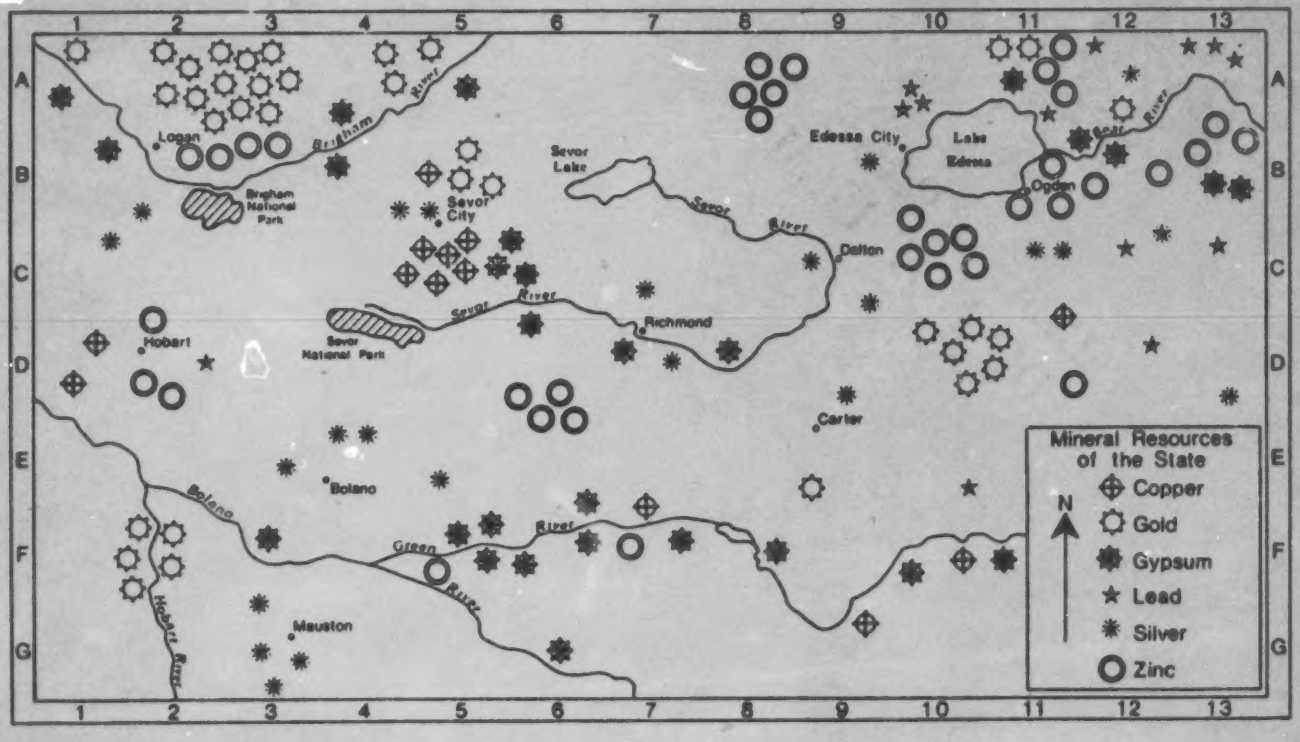


12. Which section has about half as many cows as section D?



13. In Sevor City they mostly mine

A. copper D. lead
B. gold E. silver
C. gypsum F. zinc

14. Along which river is the most gypsum found?

A. Bear D. Green
B. Bolano E. Hobart
C. Brigham F. Sevor

15. Near which two cities is there the most silver mining?

A. Ogden and Edessa City
B. Dalton and Richmond
C. Bolano and Mauston
D. Sevor City and Logan

STOP

APPENDIX B

SOURCES OF INSTRUCTIONAL MATERIALS

Atwood, B., & Paine, C. Map skills for today, Book C/Reading Level 4. Columbus, Ohio: Xerox Education Publications, 1971.

Hackler, D. How maps and globes help us. West Chester, Ill.: Benefic Press, 1970.

Maps show the earth (kit). Chicago: A. J. Nystrom and Company, 1971.

Ramano, L., & Georgiady, N. Exploring Wisconsin. Chicago: Follett Publishing Company, 1958.

Wisconsin Design for Reading Skill Development: Study Skills, Teacher's Resource Files, Skill 1 Representation, Levels C, D, E. Minneapolis: National Computer Systems, 1973.

APPENDIX C

TEACHER'S PLANS, WORKSHEETS, GAMES, AND TRANSPARENCIES

TEACHER'S PLANS

Introductory Activities

1. Objective: The student will be able to match map symbols to the man-made and natural features that they represent. The student will match colors to the appropriate features.

   Task: Read pages 46-57 in the book How Maps and Globes Help Us by David Hackler, Benefic Press. This should be read together in small groups or as a class and then discussed. When the reading is finished, some of the symbols could be drawn on the board and the children could identify them.

   Learning Center: The child reads the pages in the book while he listens to them on the tape. Symbols might be displayed for him to test his understanding when he has finished. No formal test or worksheet will be done.

2. Objective: The student will match symbols to features.

   Task: The children can work in groups as they go through and study the symbols flashcards from the kit, Maps Show the Earth. Then, independently, they do "Scrambled Symbols Worksheet" from the Pupil Workbook, page 14.

   Learning Center: Children can work in groups of two as they study the symbols flashcards. Independently, they do "Scrambled Symbols Worksheet." They check their own work with an answer key.

3. Objective: The student will name symbols that represent natural and man-made features.

   Task: The class views and discusses the filmstrip and cassette from Maps Show the Earth No. 2, "Maps Use Symbols."

   Learning Center: The children view and listen to the same filmstrip and cassette independently.

4. Objective: The student will match map symbols to natural and man-made features.

   Task: Whole class activity: Children match symbols to features on maps. Use Study Prints 1-6 from Maps Show the Earth.

   Learning Center: Two children work together as they place the symbols on the Study Prints 1-6.

5. Objective: The student will match symbols on a map to the words that represent the features on the map.

   Task: Use Map Skills for Today, Book C, pages 7 and 8 (tops). Children may do one or the other of these two worksheets. They study Map 1 and answer the questions for Map 2. They should discuss their answers.

   Learning Center: Children choose one of the worksheets. They write answers on a separate answer sheet and check their answers with the key.

6. Objective: The student will name or draw the symbol that stands for a feature on a map.

   Task: C-3 Transparency 1: Show the transparency to the class.
   Questions for first box:
   1. What is the symbol for a house?
   2. What is the symbol for a street?
   3. Point to a block: How many houses in this block?
   4. Point to a street: How many houses on this street?

   Questions for second box:
   1. What is the symbol for a city?
   2. Draw the symbol for an airline route.
   3. How many cities are on airline routes?

   Learning Center: Children answer similar questions as above. Answers are written on answer sheets. They look at a drawing rather than a transparency.

7. Objective: The student will name and locate physical and man-made features by placing symbols on a map. The student will write questions about his map and its symbols.

   Task: Floor Map from Maps Show the Earth: Work as a whole group.
   1. Children name and place name cards on the map for highways, streets, rivers, and lakes.
   2. Place various symbols on the map: The teacher states a location and the child finds that location and places the symbol.
   3. Each child should think of one question about the map and ask the rest of the class.

   Learning Center: Two children work on Floor Map.
   1. Children name and place name cards on the map for highways, streets, rivers, and lakes.
   2. Children place symbols on the map where they want.
   3. Each child writes three questions about the locations of the symbols. The partners exchange questions and answer each other's questions.

Level C Activities

1. Objective: The student will draw symbols to represent different physical features and man-made buildings.

   Task: C-2 WS. 1. Follow procedure in Teacher's Resource File (TRF) of Level C Activity 2.

   Learning Center: Each child does the WS. independently. All independently done worksheets should be put in individual folders.

2. Objective: After studying a map that has various symbols on it, the student will make a key to go with the map.

   Task: C-4 WS. 2. The children make a key to go with the map. They check their answers in class and draw answers on the board.

   Learning Center: After he does WS. 1, the child does WS. 2 independently. He checks WS. 2 with the Answer Key.

3. Objective: A student will draw symbols on a map as directed.

   Task: C-5 WS. 3 and Transparency 2. Follow the procedure in TRF of Level C Activity 5.

   Learning Center: Children have map (WS. 3) in front of them. They listen to a tape of the directions from TRF C-5. They check their papers with Transparency 2 while they listen to the correction procedures on the tape.

4. Objective: A student will answer questions about the quantity of people or fish in an area as shown by the symbols on a map.

   Task: C-8 or C-9; WS. 4 or WS. 5. Games: two people play the games together. They play one or the other.
   Directions for C-8 WS. 4:
   1. Two people play
   2. They play with two dice.
   3. One worksheet for two people.
   4. They shake the dice and the person with the highest total on both dice goes first.
   5. The first person shakes the dice. The number on the dice tells which question that person must answer. If he shakes a total of six on both dice, he must answer number six. He writes his answer in the right space on the worksheet with a colored pencil.
   6. The next person shakes the dice and answers the question that goes with the number he shook by writing the answer with a different colored pencil in the space on the worksheet.
   7. If a person shakes a number that has already been answered, he loses his turn and the other person takes a turn.
   8. When all ten questions have been answered, check the answers with an Answer Key. Give the number of miles to the person that answered the question if it is correct. If the answer is wrong, no miles are scored.
   9. Add up all the miles driven by each person. The person who has driven the most miles wins the game.

Directions for C-9 WS. 5:

1. Two people play.
2. They play with two dice.
3. They shake the dice: the person with the highest total on both dice goes first.
4. One worksheet for two people.
5. Each person needs a different colored pencil.
6. The first person shakes the dice. The number on the dice tells which question that person must answer. If he shakes a total of six on both dice, he must answer number six. He writes his answer in the right space with his colored pencil.
7. The next person shakes the dice and answers the question that goes with the number he shook by writing the answer with his colored pencil.
8. If a person shakes a number that has already been answered, he loses his turn and the other person takes a turn.
9. When all eight questions have been answered, check the answers with the key. Give the number of fish to the person that answered the question correctly. If the answer is wrong, no fish are caught.
10. Add up all the fish caught by each person. The person who caught the most fish wins the game.

Learning Center: Two people play together. They read the directions and check their own answers. Same games and rules as above.

5. Objective: The student will answer questions about a map that uses a variety of symbols that represent different features.

Task: C-10 WS. 6. Children do this worksheet independently. Answers are discussed and worksheets should be collected.

Learning Center: Children do WS. 6 independently, check their answers with an Answer Key, and put them in their folders.

Level D Activities

1. Objective: The student will distinguish between a map that tells where a product or item is found and a map that tells how much of a product is found in an area. The student will figure out by using the key how much of a product is in an area.

   Task: Activity D-1, Transparency 1 and 2. Study and discuss the transparencies. Possible questions:

   Transparency 1:
   1. Which map shows just <u>where</u> gold is found?
   2. Which map shows <u>how much</u> gold is found in the area?
   3. How much gold is found in Map B? 150 oz.
   4. How much copper is found in Map B? 75 oz.
   5. How much silver is found in Map B? 100 oz.

   Transparency 2:
   6. Which map shows just <u>where</u> corn is grown? wheat? oats?
   7. Which map shows <u>how much</u> corn is grown in the area? wheat? oats?
   8. How many bushels of corn are grown in the area of Map B? 400 bushels.
   9. How many bushels of wheat are grown? 400 bushels.
   10. How many bushels of oats are grown in the area? 200 bushels.

   Learning Center: Children look at drawings of the two maps. Two children work together. Questions are on the task cards. Children write their answers on the answer sheets and check their answers with the Answer Key.

2. Objective: The student will use a map key to tell how much of a feature is found in an area.

   Task: Activity D-2, D-4; WS. 1 and WS. 3. Games. Children play one. Directions for Games 1 and 3:
   1. Two people play.
   2. Each group of two has a map and a set of cards and a game board.
   3. Shuffle the cards and place them in a pile with the words face down.
   4. Decide on one person to go first.
   5. Place two markers on the Start position on the game board.
   6. The first person draws a card, answers the question, and checks the answer key. If the answer was correct he moves his marker the number of spaces indicated by the key. If the answer was wrong, he cannot move his marker.
   7. The next person draws, answers the question, checks the key, and moves the right number of spaces.
   8. The one who reaches the deer or Barron first is the winner.

   Learning Center: Children choose to play either of the two games. Two people play. They follow the directions on the Task Cards.

3. Objective: The student will answer questions about populations of different cities by using the map key.

   Task: Activity D-3 WS. 2: Children do this worksheet independently and then check the answers as a group. Collect papers.

   Learning Center: Children do the worksheet independently and check their own answers with the Answer Key.

4. Objective: The student will answer questions about airline routes between cities after he studies the map key.

   Task: Do WS. D-4 together in class. Discuss.

   Learning Center: Two children work together on WS. D-4. One worksheet for two people.

5. Objective: The student will make a map of Wisconsin and use symbols to represent features in the state that he chooses to show.

   Task: Two or three children may work together. Give each group an outline map of Wisconsin. Each group should have the book, Exploring Wisconsin by Louis Romano and Nicholas P. Georgiady. Children can decide what kind of map they want to make:
   1. A product map, p. 59
   2. A population map, pp. 5, 98
   3. An industries map, pp. 68-80
   4. A lumbering map, p. 34

   Learning Center: Children work in groups of two or three. Using an outline map of Wisconsin and the book, Exploring Wisconsin, they can make one of the types of maps suggested above. They follow the directions on the Task Card.

Level E Activities

1. Objective: After studying two different types of maps, the student will answer questions about what crops are grown, where they are grown, and how much of one crop is grown in an area.

   Task: Activity E-1, Transparency 1. Show the transparency and discuss. Point out that both maps have the same symbols that stand for different things. Follow the procedure for activity 1 in Teacher's Planning Guide (TPG) for Level E.

   Learning Center: Children look at a reproduction of Transparency 1. As they study the maps, they listen to a tape recording of the questions and answers found in the TPG for Activity 1, Level E.

2. Objective: The student will make a population map and key for four different sized cities.

   Task: Activity E-2 WS. 1. Each child makes a population key for four different sized cities. He writes the symbols next to the town names on the map of WS. 1. He makes up two questions about his map and exchanges with someone. The children answer each other's questions.

   Learning Center: Children do the same activity as described above. They leave their maps and questions in the station so that someone else can answer their questions.

3. Objective: The student will use symbols on a map to show four different terrains and to show railroads, airlines, and roads. The student will make a key to go with his map.

   Task: Activity E-3 WS. 1. Take a new WS. 1.
   Children make a terrain map showing these four terrains: mountains, desert, plains, lowlands. They use the names of cities to determine what terrains are in certain areas of the map. Children may use colors or symbols to show terrain. They should also add railroads, airlines, and roads. Children make a key to go with their map. They write two questions about their map and they share their questions and maps.

   Learning Center: Children do the same activities as described above. They leave their maps and questions in the stations for someone to answer and study. They follow the directions on the task card.

4. Objective: The student will make a map that shows where four different crops are grown.

   Task: Activity E-4 WS. 1. Take a new WS. 1.
   The class should decide on four crops they will show. Each child makes his own map showing where the four crops are grown. He makes a key for this map. The children can compare their maps as a group.

   Learning Center: Children do the same activity as above. Each child chooses his own four crops. He places his finished map in his folder.

5. Objective: The student will make a map that shows how much of one crop is grown in different areas.

   Task: Activity E-5 WS. 1. Take a new WS. 1.
   The class chooses one crop to show different amounts in an area. Each child makes a quantity map to show how much of that crop grows in different parts of the map. The children share maps with each other.

   Learning Center: Children do the same as above. Each child chooses one crop and shows quantity. He places his finished map in his folder.

6. Objective: The student will answer questions about a map that uses different symbols to represent different features.

   Task: Activity E-6 WS. 2. The children complete the worksheet independently. Their answers are discussed in class.

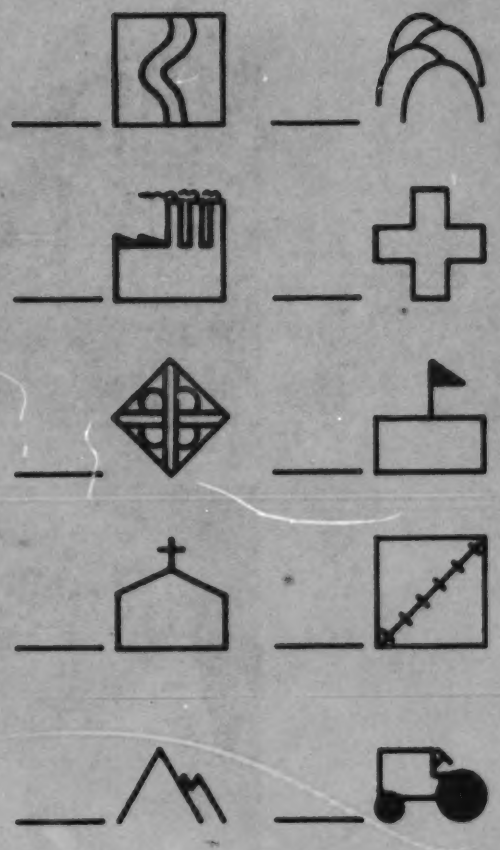
   Learning Center: Each child does WS. 2 and checks his answers with the Answer Key. He puts his WS. in his folder.

Introductory Activity 2

Scrambled Symbols *

First, unscramble the ten mixed-up words at right. Then, match these words to the map symbols at the far right.

1. _____ chools
2. _____ lilh
3. _____ hchurc
4. _____ marf
5. _____ inerchangcte
6. _____ orfacty
7. _____ dailrora
8. _____ virer
9. _____ pitalhos
10. _____ noutmain



*Activity from Maps Show the Earth, A.J. Nystrom and Company, Chicago, 1971, Pupil Workbook, p. 14.

Map Symbols *

Reviewing Map Symbols. On Map 1 find each map symbol listed below. Study each symbol carefully.

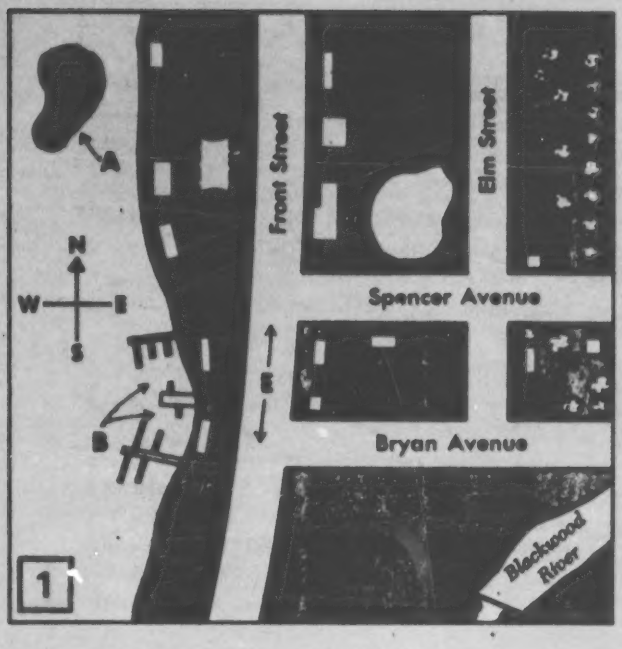
A. a state boundary
B. a state capital
C. a bay
D. mountains
E. a lake
F. a river
G. an airport
H. a railroad
I. part of a coastline
J. a city that is not a state capital

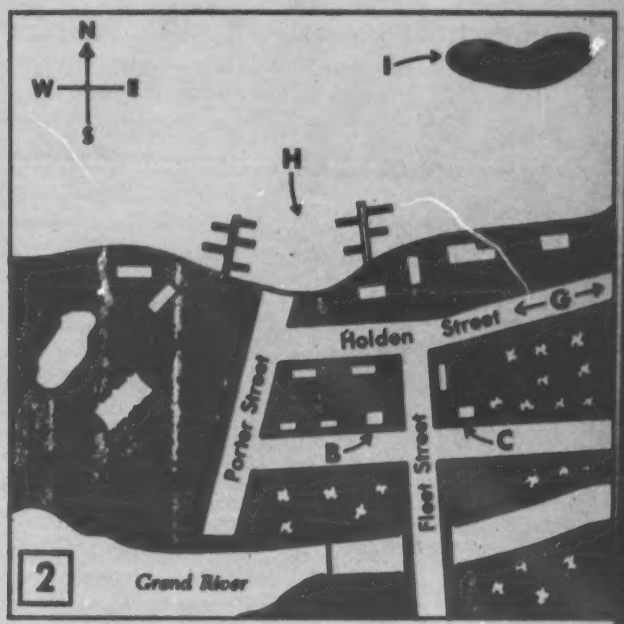
Finding Map Symbols. On Map 2 find each map symbol listed below. Write the letter of the symbol on the line.

1. ___ a lake
2. ___ a railroad
3. ___ a bay
4. ___ a river
5. ___ an airport
6. ___ a state capital
7. ___ mountains
8. ___ a state boundary
9. ___ part of a coastline
10. ___ a city that is not a state capital

* Activity from: Atwood, Beth and Paine, Carolyn. Map Skills for Today, Book C/Reading Level 4. Columbus, Ohio: Xerox Education Publications, 1971, p. 7.

Map Symbols*





Reviewing Map Symbols. The following map symbols appear on Map 1. Find each symbol and study it carefully.

A. an island	E. a street	I. a school
B. a harbor	F. a bridge	J. a church
C. a tunnel	G. a canal	K. trees
D. buildings	H. a dam	L. a pond

Finding Map Symbols. On Map 2 find each symbol listed below. Write the letter of the symbol on the line.

1. ___ a bridge	5. ___ trees	9. ___ a tunnel
2. ___ buildings	6. ___ a street	10. ___ a dam
3. ___ a school	7. ___ a canal	11. ___ a pond
4. ___ a church	8. ___ a harbor	12. ___ an island

*Activity from: Atwood, Beth and Paine, Carolyn. Map Skills for Today, Book C/Reading Level 4. Columbus, Ohio: Xerox Education Publications, 1971, p.8.

Skill 1 – Maps
Nonpictorial Symbols

The teacher may wish to refer to the activities for Level B, Skill 1 to review the concept that a map shows the arrangement of objects in the environment and is always smaller than the actual environment represented.

CONCEPT DEVELOPMENT ACTIVITIES

Concept: The child understands that abstract two-dimensional symbols may represent objects in the environment. Illustration: may represent a real house.

1 **Materials:** Transparency 1 from Level B, Skill 1, activity 6; paper and pencils.

Procedure:

a. The teacher points out the realistic picture symbols in the transparency, introducing the meaning of the word *symbol*—i.e., the pictures of the car, birds, etc., stand for the real objects.

b. Then the teacher asks whether they can draw a less realistic picture of one of the objects (for instance, the car) which will still represent the real object. A pupil draws a more abstract symbol for the car on the chalkboard. The teacher then asks the children to draw less realistic symbols of the rest of the pictures on the transparency.

c. The children then exchange papers. The teacher points out that each child has a different representation of the same object; therefore, a key may be needed to explain what is meant by each symbol.

2 **Materials:** Mimeographed copies of worksheet 1, pencils.

Procedure:

a. The teacher draws a large key on the chalkboard identical to the key on the worksheet. He explains that the children are to create symbols to fit in the boxes of the key. The symbols are not supposed to look exactly like the objects, but they are to stand for them. The teacher asks one child to draw the first symbol on the chalkboard. The children do the others independently.

b. After the children have completed the worksheet, the teacher chooses children to fill in the blanks of the key on the chalkboard with symbols they have created. The drawings of several children can be compared to show the variety of symbols used for the same object.

Concept: The child understands that the use of abstract two-dimensional symbols is arbitrary in representing objects in the environment. Illustration: A dot may be used to represent a city on one map and a person's house on another.

3 **Materials:** Transparency 1, overhead projector, wide-tipped felt pen.

Procedure:

a. The differences in the two maps are discussed with the children, bringing out the idea that symbols are arbitrary. Dots can represent houses, cities, or something else. Lines can represent streets, airline routes, etc.

b. The teacher adds X's to the keys and both maps. The children can discuss and decide what the X's could be, then place labels in the key to show what the X's stand for. (For example, they could represent children near the houses or small towns near the cities.)

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SKILL DEVELOPMENT ACTIVITIES

Rationale: The children first learn the purpose of a map key by attempting to interpret map symbols without a key. They then learn to use a key to locate points on a map and to make further interpretations of it.

4 **Materials:** Mimeographed copies of worksheet 2, pencils.

Procedure: The teacher asks the children what the symbols used in the map might mean. Since their answers may differ, the need for creating a key may become apparent. The children then draw the symbols from the map in the appropriate boxes in the key.

5 **Materials:** Mimeographed copies of worksheet 3, pencils, transparency 2, overhead projector.

Procedure:

a. The teacher explains that the pupils are to use the key to help them add symbols to the map. On the map, the children should draw symbols in their appropriate locations as called for in the instructions.

b. The teacher gives the following instructions:

Draw a gas station between the buildings on Main Street. (The teacher should check to see if the children understand what is required of them before continuing.)
Put a park next to the hospital on Main Street.
Draw three more buildings on Main Street across from the first two.
Put a school on Central Avenue near the park on South Street.
Put a lake by the park on North Street and East Avenue.
Put an airport near the gas station on South Street and East Avenue.
Draw three houses on each side of East Avenue between Main Street and North Street.

c. The transparency is projected to check the children's use of symbols.

6 **Materials:** Butcher paper, crayons.

Procedure:

a. After dividing the children into small groups, the teacher tells them to make a map of the Old West. They need to create their own symbols and use them in making the map. The map must also have a key. Children should create symbols for mountains, Indians, cattle, railroads, railroad station, waterhole, and other items they wish to include on the map.

b. When the maps are completed they can be displayed. The teacher and other children ask questions about the maps (e.g., Would the cattle have to cross the mountains to get to the railroad station?).

Rationale: The child uses a key to interpret a map containing nonpictorial symbols.

☆ 8 **Materials:** Mimeographed copies of worksheet 4, pencils.

Procedure: The teacher points out the importance of using a key since the symbols are not drawn realistically. After the children do the worksheet independently, the answers are discussed.

☆ 9 **Materials:** Mimeographed copies of worksheet 5, pencils.

Procedure: The importance of using the key should be pointed out since the symbols are not drawn realistically. The children do the worksheet independently and their answers are discussed.

☆ 10 **Materials:** Mimeographed copies of worksheet 6, pencils.

Procedure: The children do the worksheet independently. Their answers are discussed.

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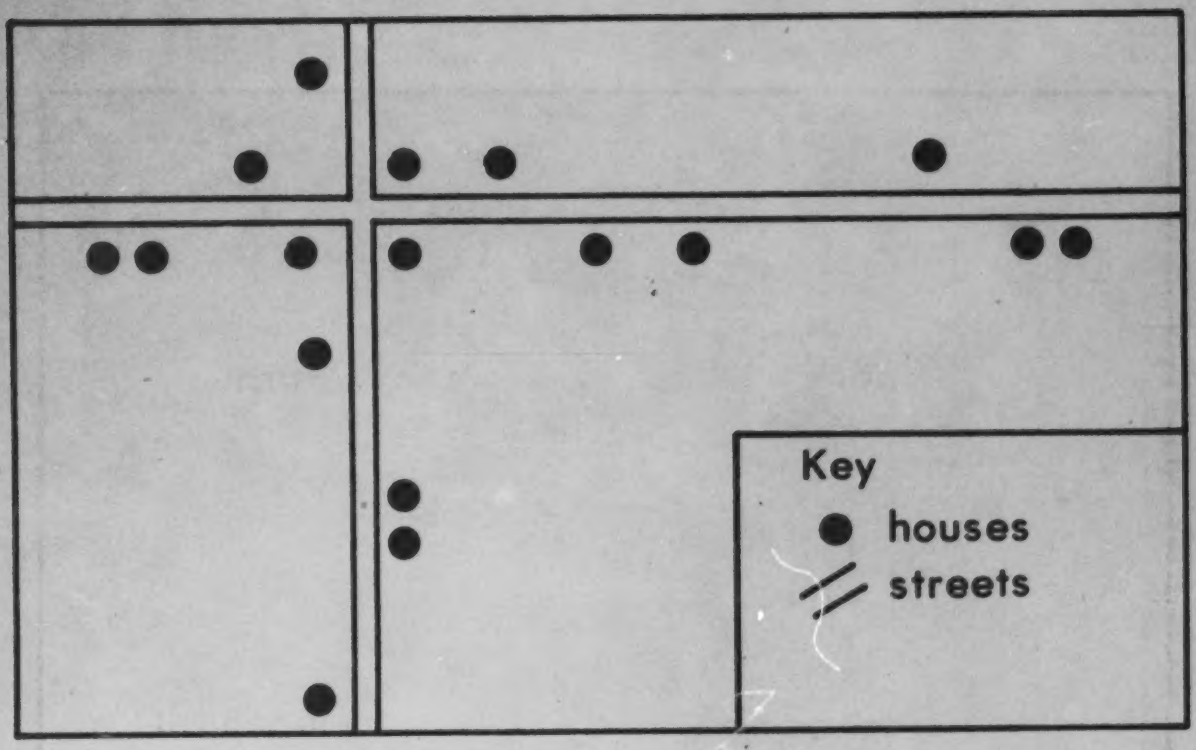

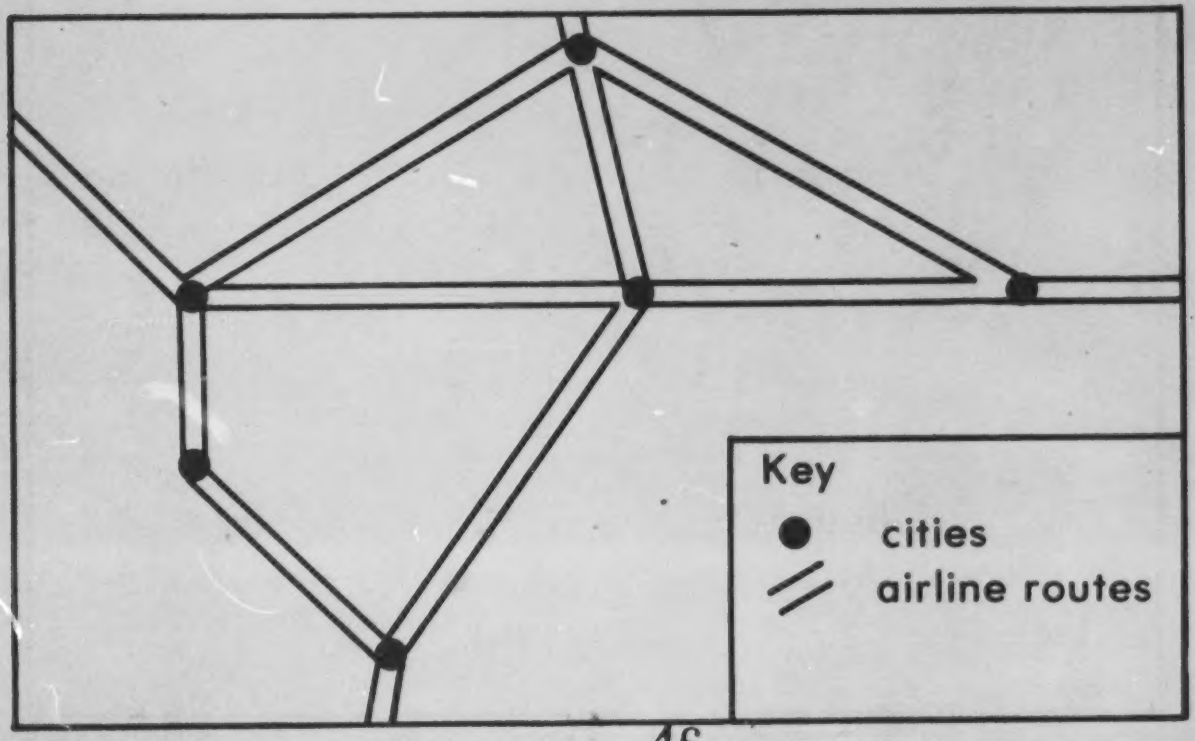

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KEY

park

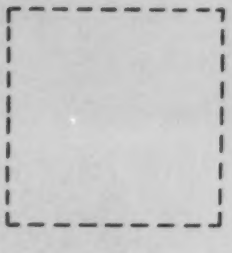
farm

lake

hospital

airport

gas station



house

school

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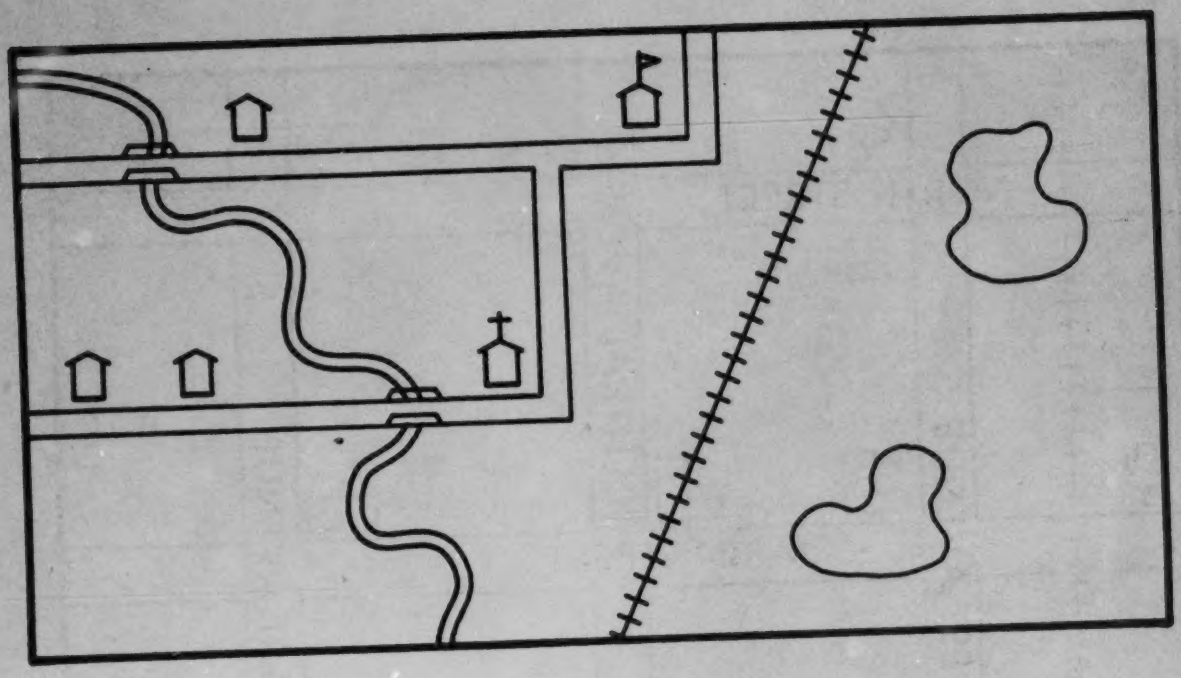

KEY

river

house

bridge

school

railroad

church

street

pond

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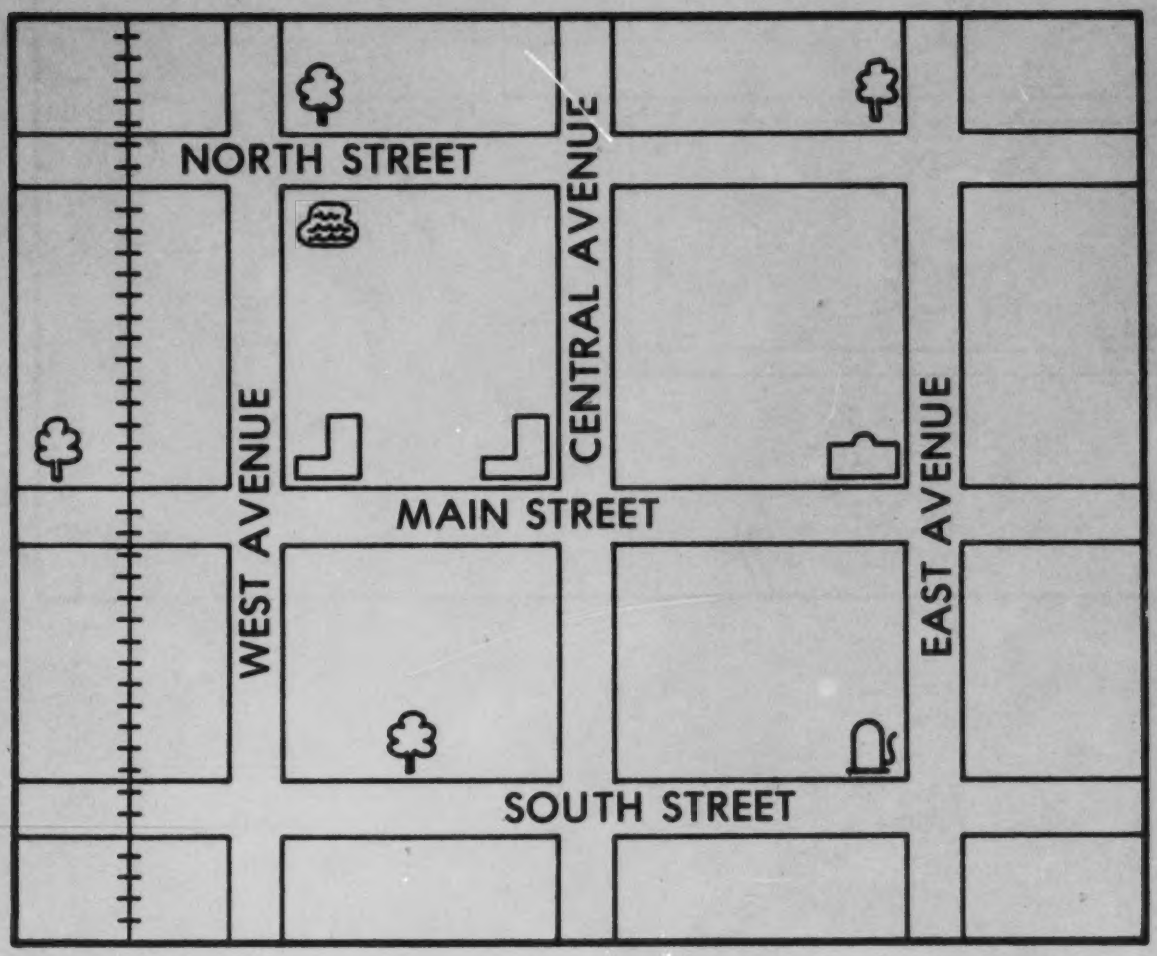

KEY

railroad

building

hospital

gas station

park

airport

school

house

lake

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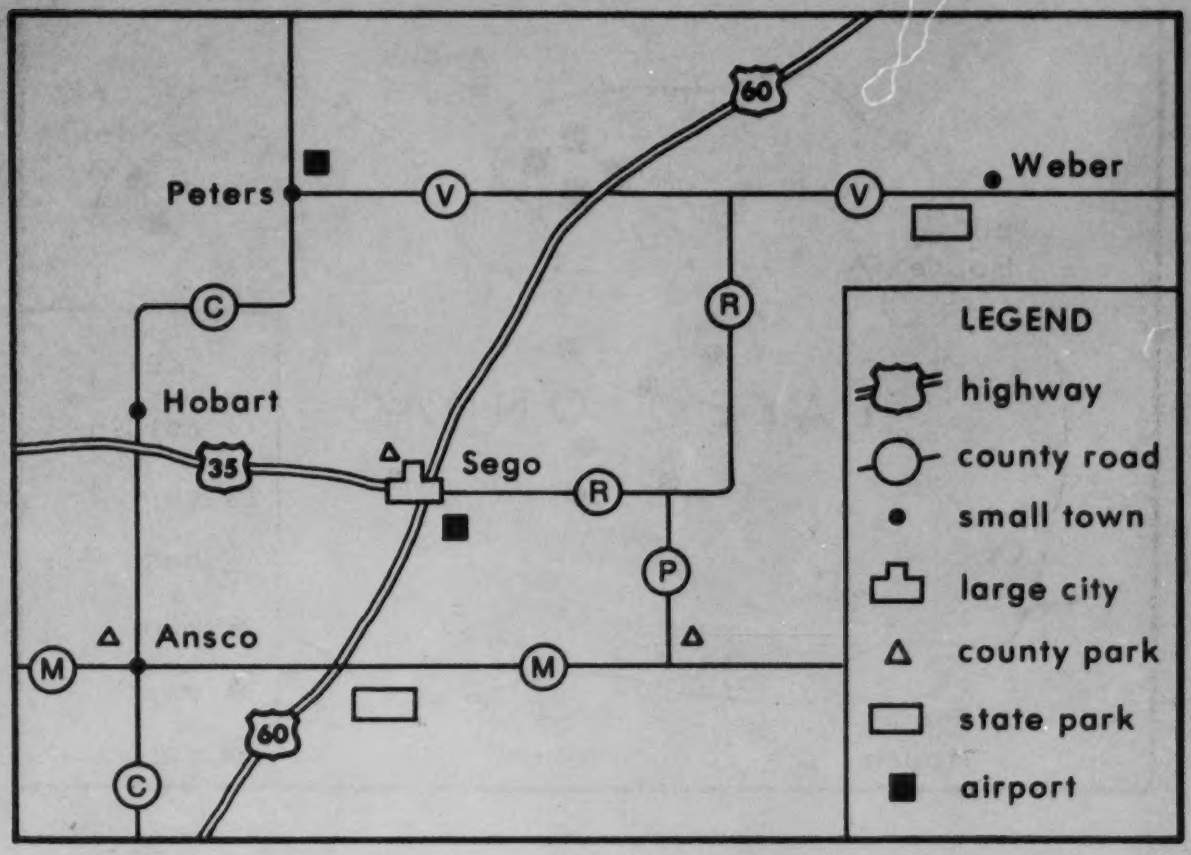

1. How many state parks are there? _____
2. Which small town is nearest a state park? _____
3. Which small town is nearest a highway? _____
4. Which small town has an airport? _____
5. Which road goes through Hobart? _____
6. What is the name of the large city? _____
7. How many small towns are on the map? _____
8. Which small town is nearest a county park? _____
9. Which roads does county (P) connect? _____
10. What is the shortest route between Weber and Ansco? _____

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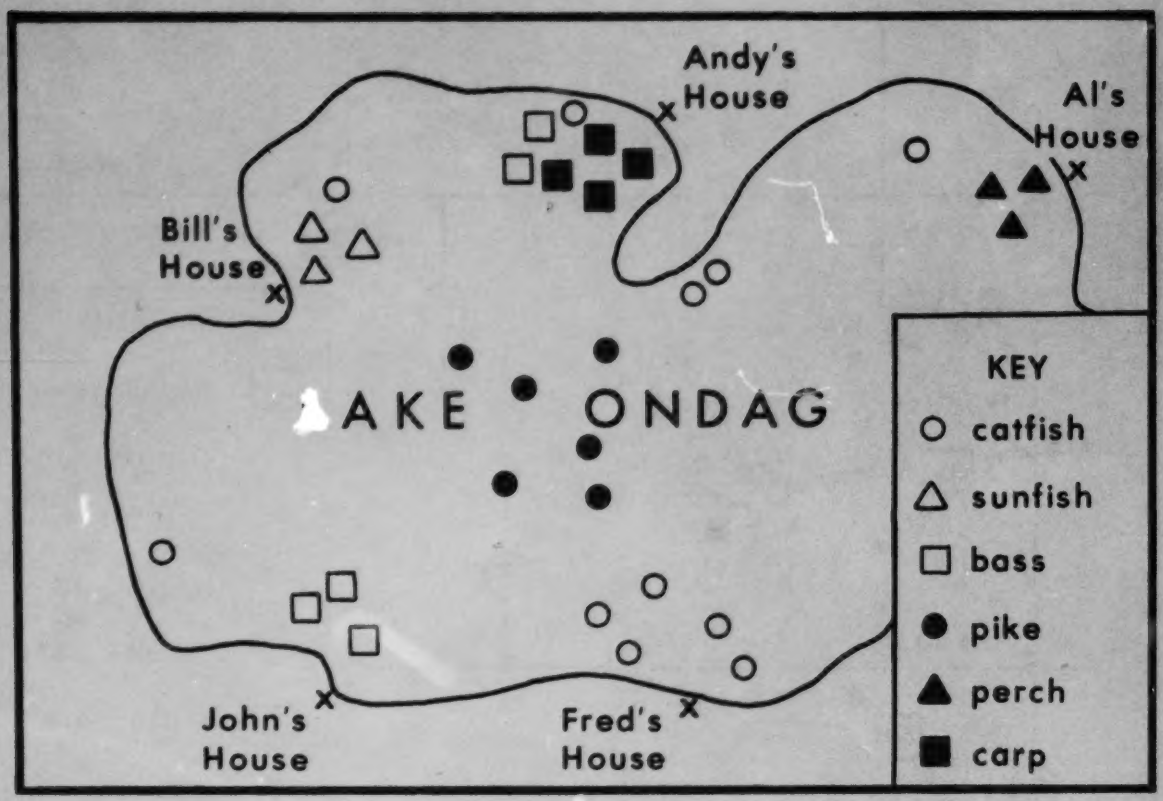

1. What kind of fish would you find near John's house? _____
2. Which fish is found in most places? _____
3. Which fish is found only in the middle of the lake? _____
4. There are more _____ than any other kind of fish in the lake.
5. Near Andy's house there are more _____ than bass.
6. Near Fred's house there are only _____.
7. If you like perch, at whose house would you fish? _____
8. If you like to catch several different kinds of fish, at whose house would you fish? _____

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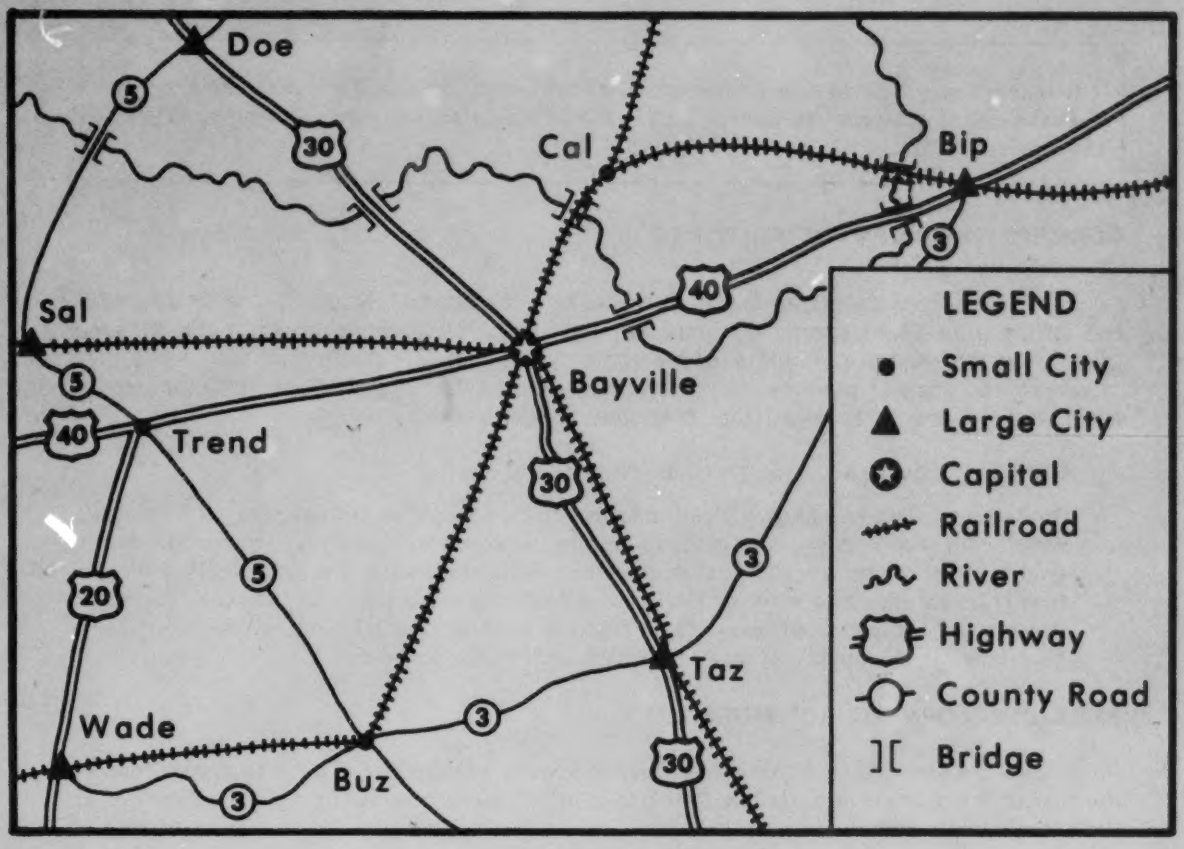

1. How many small cities are on the map? _____
2. If you took the shortest route from Buz to Bayville, what would you travel in? _____
3. Which highway goes close to a railroad for a long way? _____
4. How many bridges would you cross if you went from Doe to Bip? _____
5. What city would you pass through if you went by train from Wade to Bayville? _____
6. Which city can only be reached by train? _____
7. Which large city is closest to a river? _____
8. What is the shortest route between Bip and Taz? _____
9. How many cities do both a railroad and a highway pass through? _____
10. How many large cities are on county road 5? _____

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Skill 1 — Maps
Point and Line Symbols

The teacher may wish to refer to the activities for Level C, Skill 1 to review the concept that the use of abstract two-dimensional symbols is arbitrary in representing objects in the environment.

CONCEPT DEVELOPMENT ACTIVITIES

Concept: The child understands that symbols on a map can show qualitative or quantitative information. Illustration: ⊗ may be used to represent wheat grown in a given area (qualitative information). A cluster of the same symbols may indicate that a large quantity of wheat was grown (quantitative information). (Note: The children are not expected to learn these terms or to make this distinction independently.)

1 **Materials:** Transparencies 1 and 2, overhead projector.

Procedure: Teacher and children discuss the two maps on transparency 1 to decide which map shows only *where* gold is found in the area and which map shows *how much* gold is found in the area. The same procedure is followed with copper and silver on the first transparency and with corn, wheat, and oats on the other transparency. Then the pupils study maps in textbooks to determine whether the information conveyed tells how much of a substance there is (quantitative information).

SKILL DEVELOPMENT ACTIVITIES

Rationale: The child learns that size differences in symbols can reflect size differences in the environment. He interprets this type of quantitative information using point symbols at first, then line symbols.

✡2 **Materials:** Mimeographed copies of worksheet 1, pencils.

Procedure: The children do the worksheet independently. Their answers are discussed.

✡3 **Materials:** Mimeographed copies of worksheet 2, pencils.

Procedure: The children complete the worksheet independently. Answers are discussed when the children are finished.

✡4 **Materials:** Mimeographed copies of worksheet 3, pencils.

Procedure: The children complete the worksheet independently. Answers are discussed when the children are finished.

✡5 **Materials:** Mimeographed copies of worksheet 4, pencils.

Procedure: The children complete the worksheet independently. Their answers are discussed.

6 **Materials:** Drawing paper, crayons.

Procedure: The teacher discusses with the children the kinds of maps that can be made (e.g., products, population, political). Each group of three to five children makes a map related to some subject matter under study. The map should use point and line symbols to convey qualitative and quantitative information; that is, each map should answer questions of *how much* as well as *where* and *what*.

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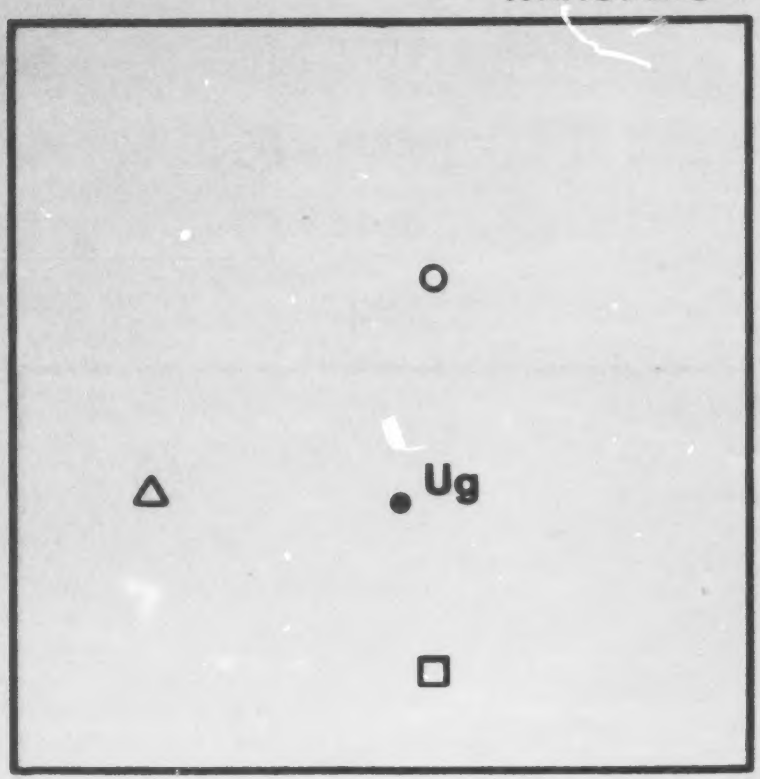
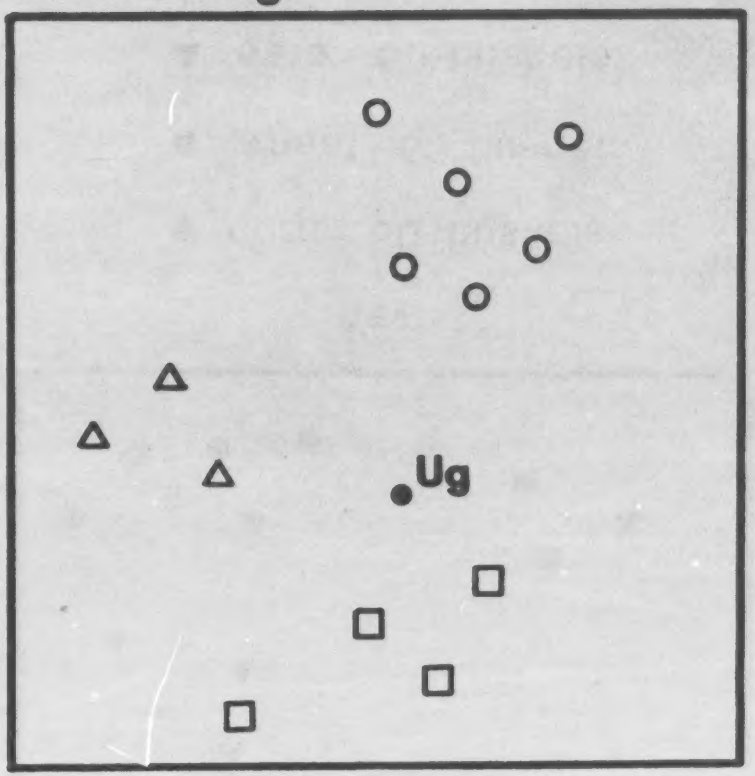
Minerals Found Near Ug



Key

- gold
- copper
- silver



Key

- gold – 25 oz.
- copper – 25 oz.
- silver – 25 oz.

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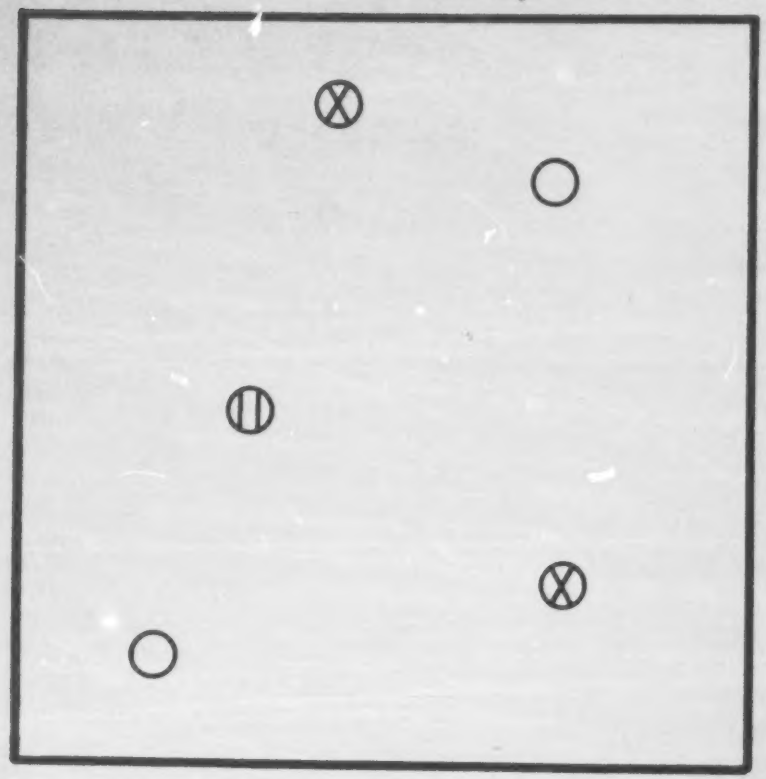
Crops Grown in Harris County

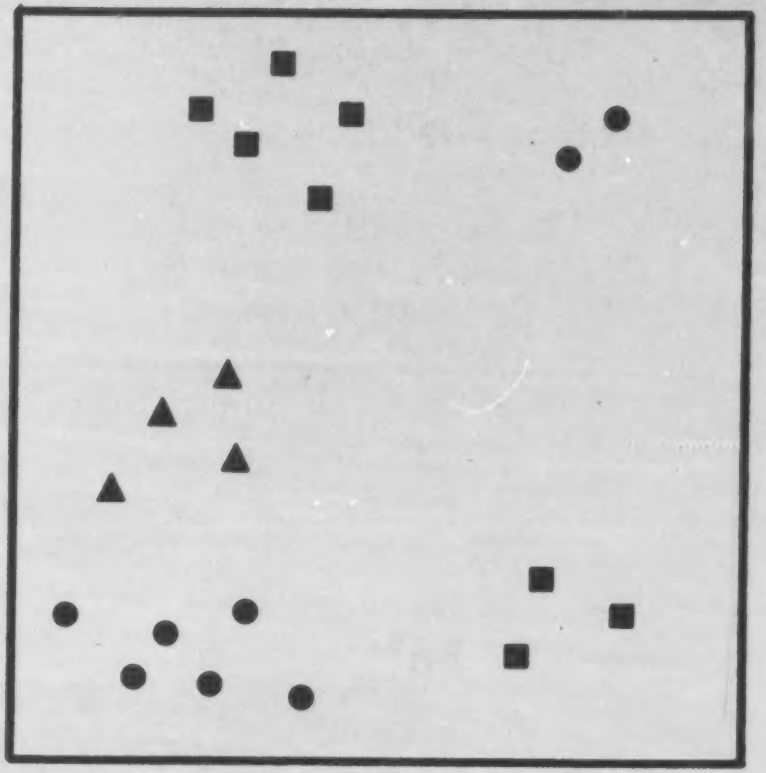


Key

○ corn

⊗ wheat

▯ oats



Key

● corn – 50 bushels

■ wheat – 50 bushels

▲ oats – 50 bushels

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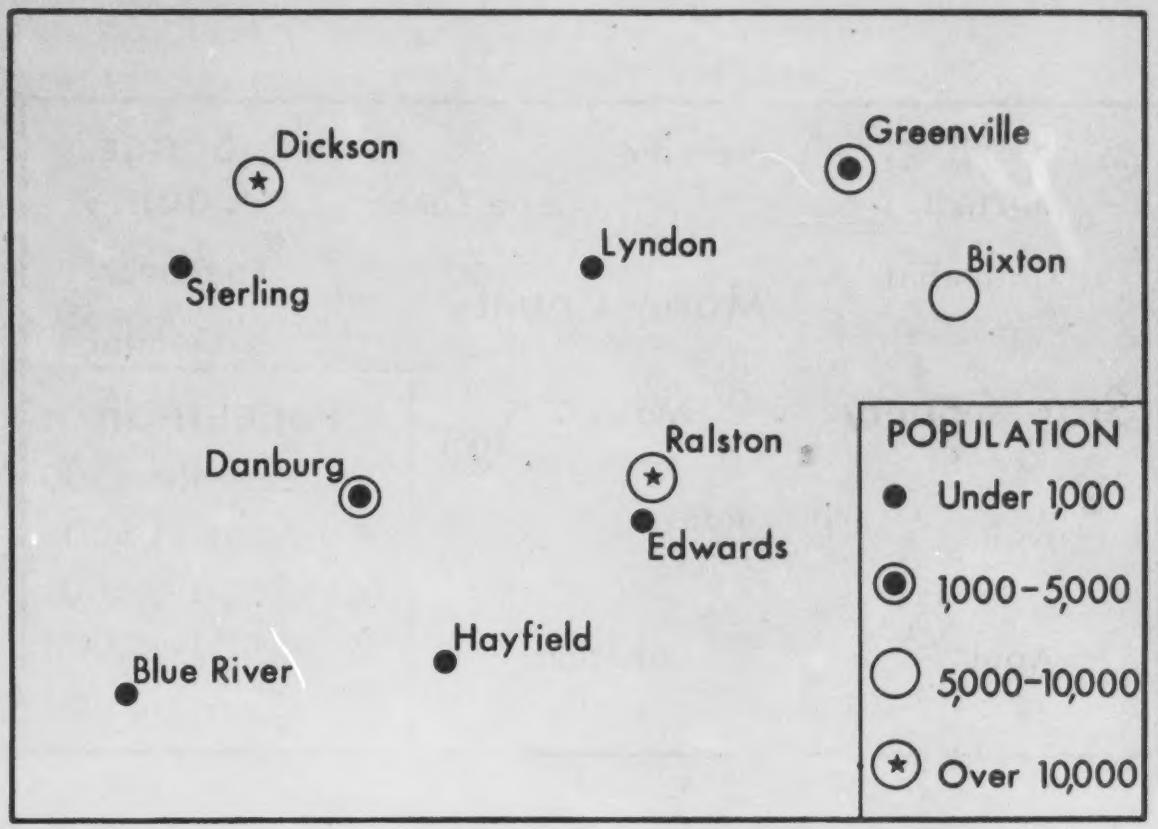

1. State the approximate size of each town:

   Ralston _____

   Edwards _____

   Greenville _____

   Blue River _____

   Bixton _____

2. Which town is the smallest—Hayfield, Bixton, or Greenville? _____
3. If you live in Bixton and want to go to the nearest larger town for shopping, what town would you choose? _____
4. What size town appears most often on this map? _____
5. What size town appears only once? _____

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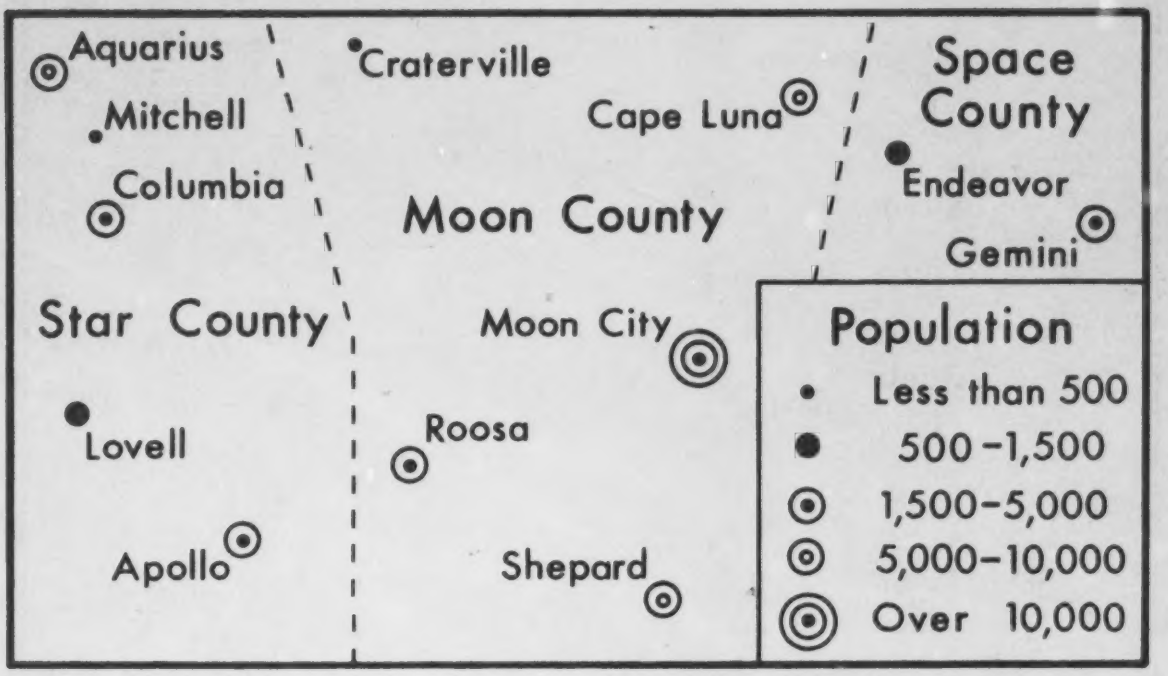

1. Which city has the largest population? _____
2. If Sam wants to move from Cape Luna to a city of the same size in another county, where could he go? _____
3. A city with a population of 1,236 in Space County could be _____ .
4. The cities with the smallest population are _____ and _____ .
5. The city with the largest population in Star County is _____ .

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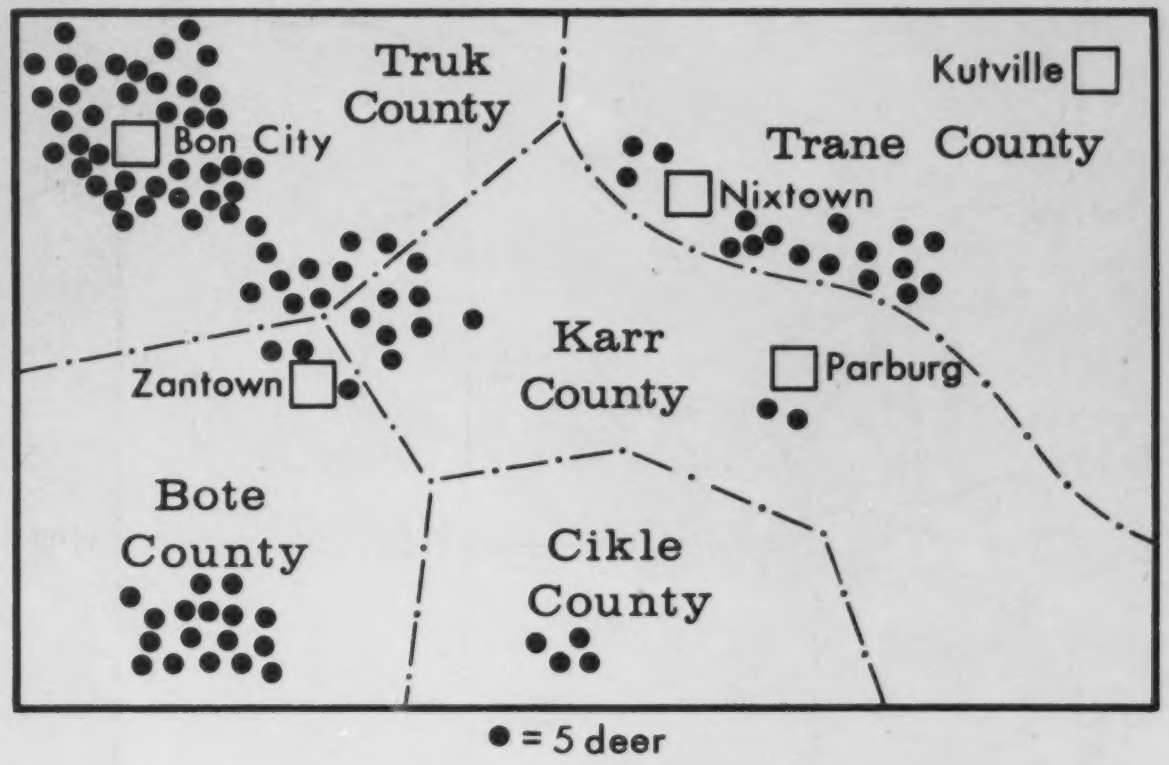

1. Which county has the most deer? _____
2. How many deer are there in Bote? _____
3. Which county has the fewest deer? _____
4. Which city has the most deer around it? _____
5. How many deer does Kutville have around it? _____
6. Which city has some deer near it but very few? _____

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Are you a good hunter?

19 21

18 20 22

17

15 13 11

16 14 12 10

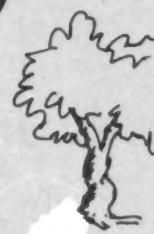
9

8

2 4 6

Start

1 3 5 7



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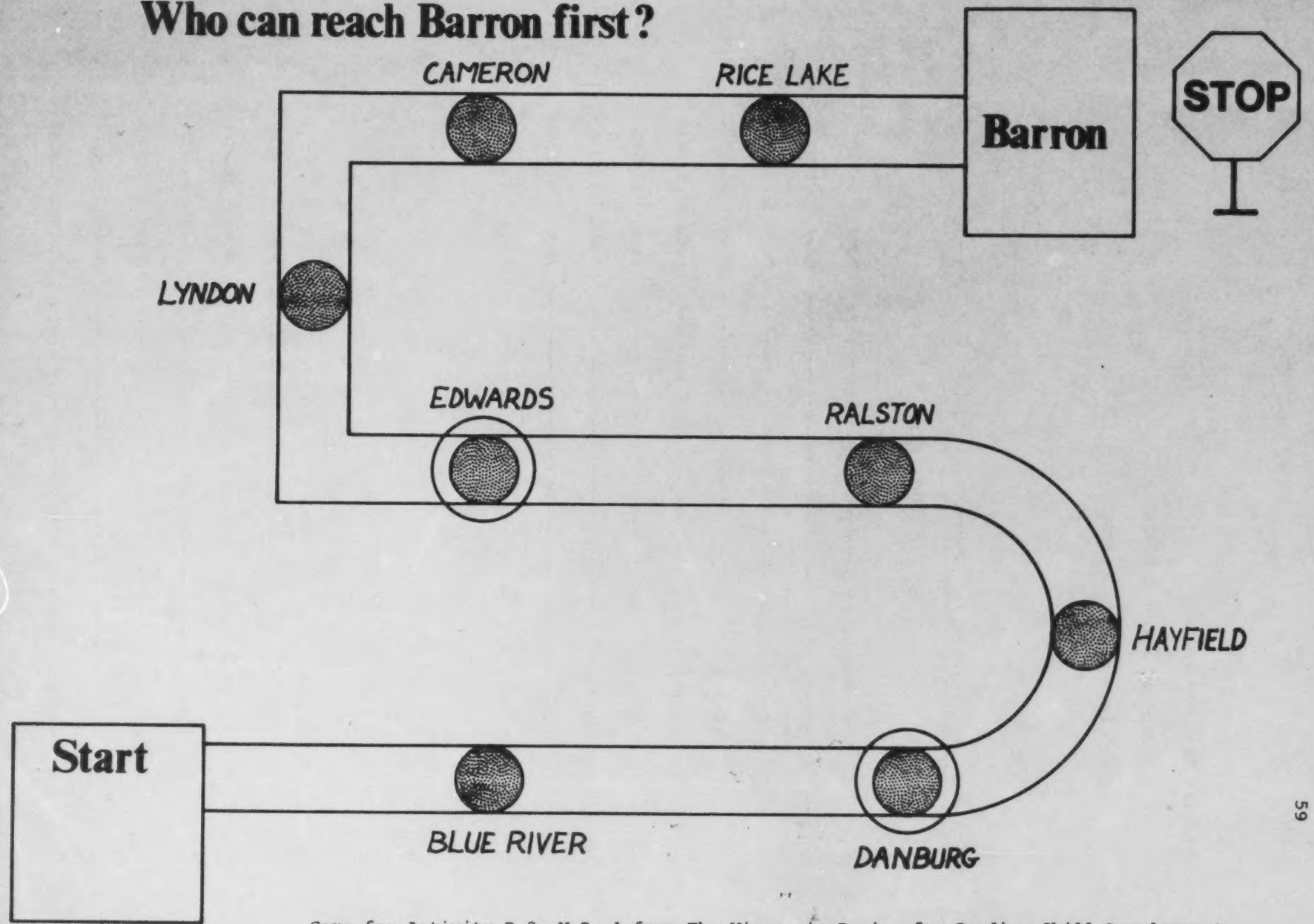
Game for Activity D-4, W.S. 3 from The Wisconsin Design for Reading Skill Development.

Who can reach Barron first?



Game for Activity D-2, W.S. 1 from The Wisconsin Design for Reading Skill Development.

Answer Keys for 2 Games

Activity D-2, W.S. 1 WDRSD

Activity D-4, W.S. 3 WDRSD

Who Can Reach Barron First? D-1

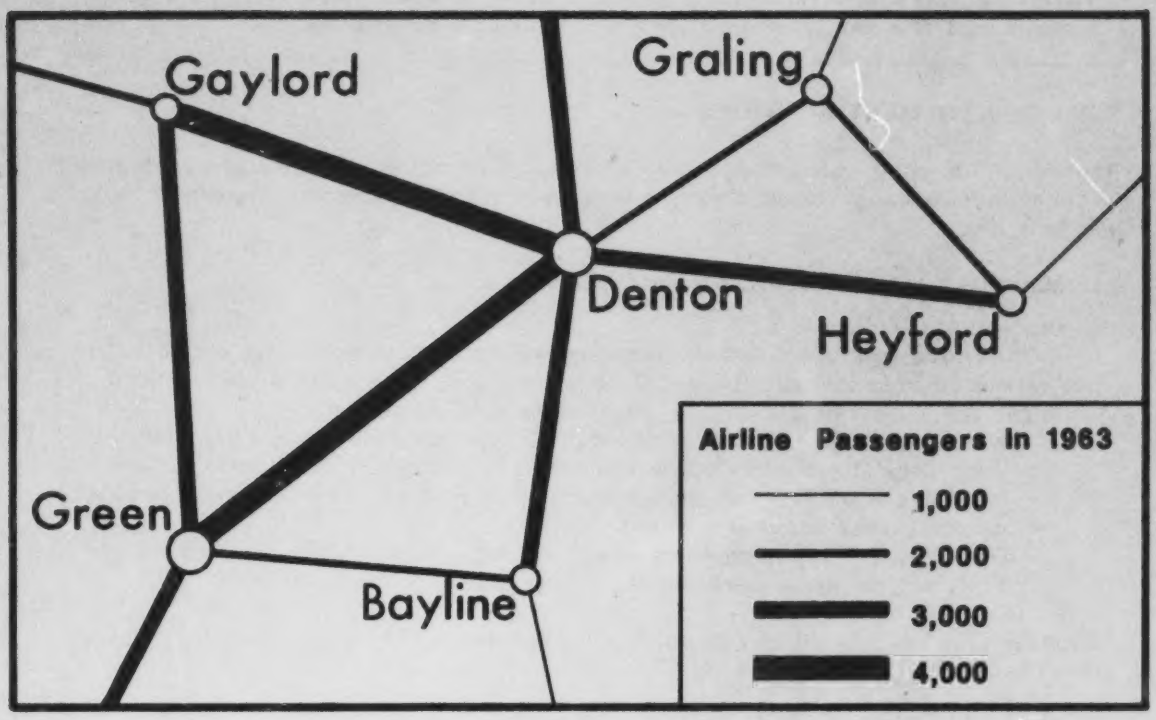
ANSWER KEY

1. Over 10,000 ---------- Move 2 cities
   Under 1,000 ---------- Move 1 city
   1,000 - 5,000 ---------- Move 3 cities
   Under 1,000 ---------- Move 1 city
   5,000 - 10,000 ---------- Move 2 cities
2. Hayfield ---------- Move 3 cities
3. Ralston ---------- Move 3 cities
4. Under 1,000 ---------- Move 4 cities
5. 5,000 - 10,000 ---------- Move 4 cities

Are You a Good Hunter? D-3

ANSWER KEY

1. Truk County ---------- Move 5 tracks
2. 100 deer in Bote ---------- Move 8 tracks
3. Cikle ---------- Move 6 tracks
4. Bon City ---------- Move 7 tracks
5. 0 ---------- Move 7 tracks
6. Parburg ---------- Move 9 tracks



1. How many airline passengers went from Green to Denton? _____
2. How many went from Denton to Heyford?_____
3. On which route would you expect more passengers—from Green to Gaylord or from Graling to Denton? _____
4. Which airport has the most passenger traffic? _____
5. Which has the least? _____

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Skill 1 — Maps
Point, Line, and Area Symbols

The teacher may wish to refer to activities for Level D, Skill 1 to review the concept that symbols on a map can show qualitative or quantitative information.

SKILL DEVELOPMENT ACTIVITIES

Rationale: The child learns to use area symbols to obtain qualitative and quantitative information from maps; that is, the child can answer questions pertaining to where, what, and how much.

1 **Materials:** Transparency 1, overhead projector.

Procedure:

a. The teacher points out that the same symbols are used on both maps and that they stand for area characteristics—i.e., they show something about a piece of land.
b. The teacher asks the following questions to elicit discussion:
What does Map A show? (what kinds of crops are grown in a given area)
What does Map B show? (how much corn is grown in a given area)
Does Map A tell you how much wheat is grown? (no) What does it tell you about wheat? (where wheat is grown)
Does Map B tell you anything about the crops shown in Map A? (no)
Point out the areas where ten to twenty bushels of corn are grown.

Rationale: The child learns to use point, line, and area symbols appropriately to show given characteristics of an area.

2 **Materials:** Mimeographed copies of worksheet 1, pencils.

Procedure:

a. Each child makes up a population key to show at least four different sizes of towns for the map. He then writes the symbols next to the town names, deciding on the size of each town.
b. He next writes questions about the interpretation of his map to test his classmates on their map-reading abilities.
c. Completed maps are exchanged in small groups and the children quiz each other.

3 **Materials:** Unused mimeographed copies of worksheet 1, pencils, crayons.

Procedure:

a. Each child makes up a key showing at least four types of terrain. (The names of the towns suggest various terrains—lowlands, mountains, plains, and desert.) The area symbols may consist of colors or other abstractions.
b. The child adds symbols for railroads, airlines, and roads to show transportation routes.
c. He next writes questions about the interpretation of his map to test his classmates on their map-reading abilities.
d. Completed maps are exchanged in small groups and the children quiz each other.

4 **Materials:** Unused mimeographed copies of worksheet 1, pencils.

Procedure:

a. Each child makes up a key showing at least four crops that are grown, using any symbols for whatever product he chooses. The map, however, should convey only qualitative information—i.e., it should show only the locations where various products are grown, not the quantities of each crop that are produced.

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b. He next writes questions about the interpretation of his map to test his classmates on their map-reading abilities.
c. Completed maps are exchanged in small groups and the children quiz each other. Each child keeps his map if the class is going to participate in activity 5.

5 **Materials:** Unused mimeographed copies of worksheet 1, pencils. (Each child should also have his map from activity 4.)

Procedure:
a. Each child uses the symbols from his crop map to make up a key showing different quantities of a single crop on the clean map. He fills in the map so it shows only quantitative information regarding the crop.
b. He next writes questions about the interpretation of his map to test his classmates on their map-reading abilities.
c. Completed maps are exchanged in small groups and the children quiz each other.

Rationale: The child learns to interpret point, line, and area symbols on maps.

☆ 6 **Materials:** Mimeographed copies of worksheet 2, pencils.

Procedure: The children complete the worksheet independently. Their answers are discussed.

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Map A

Crops

Oats

Wheat

Hay

Map B

Bushels of Corn per Acre

Under 10

10–20

Over 20

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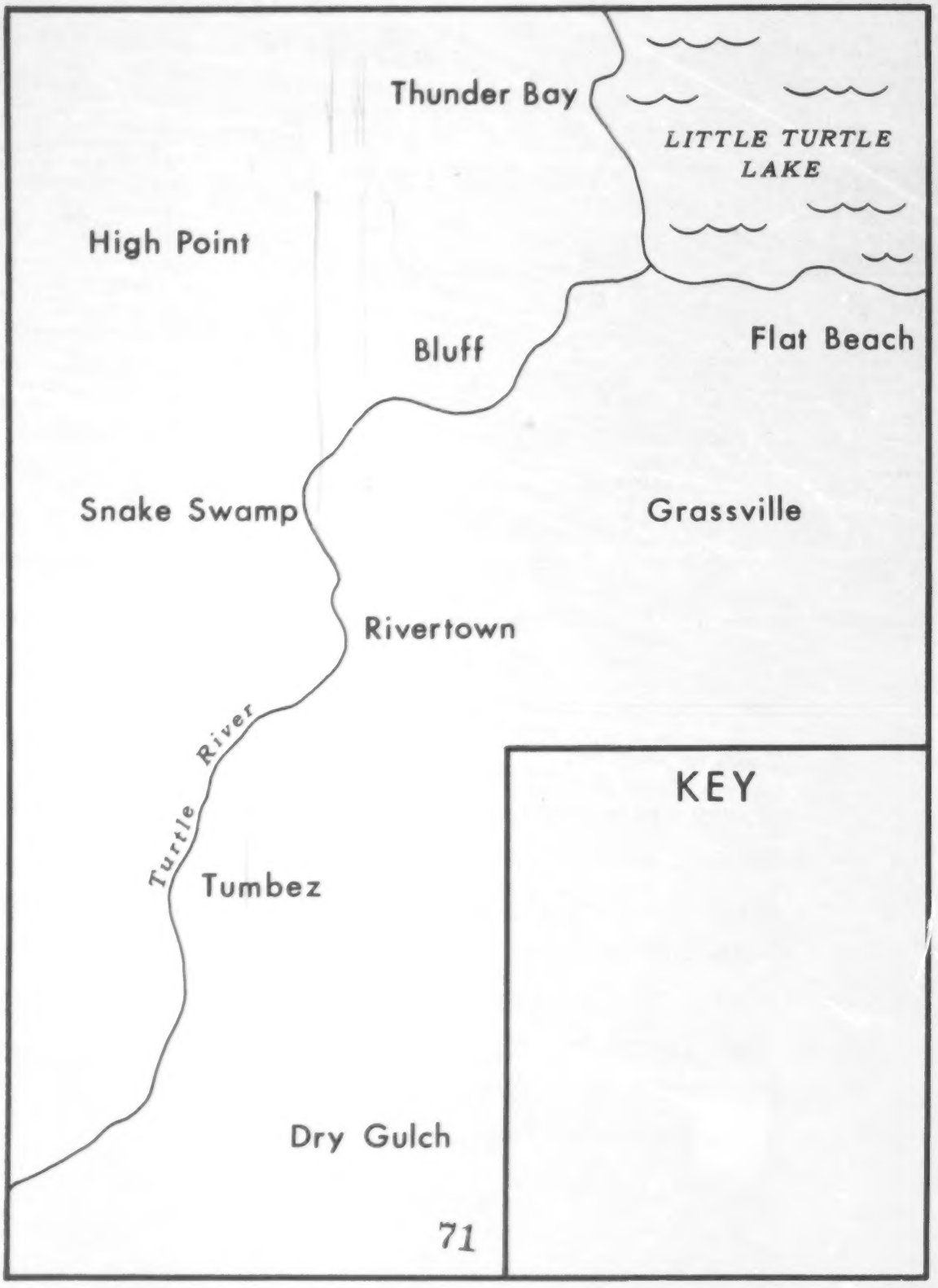

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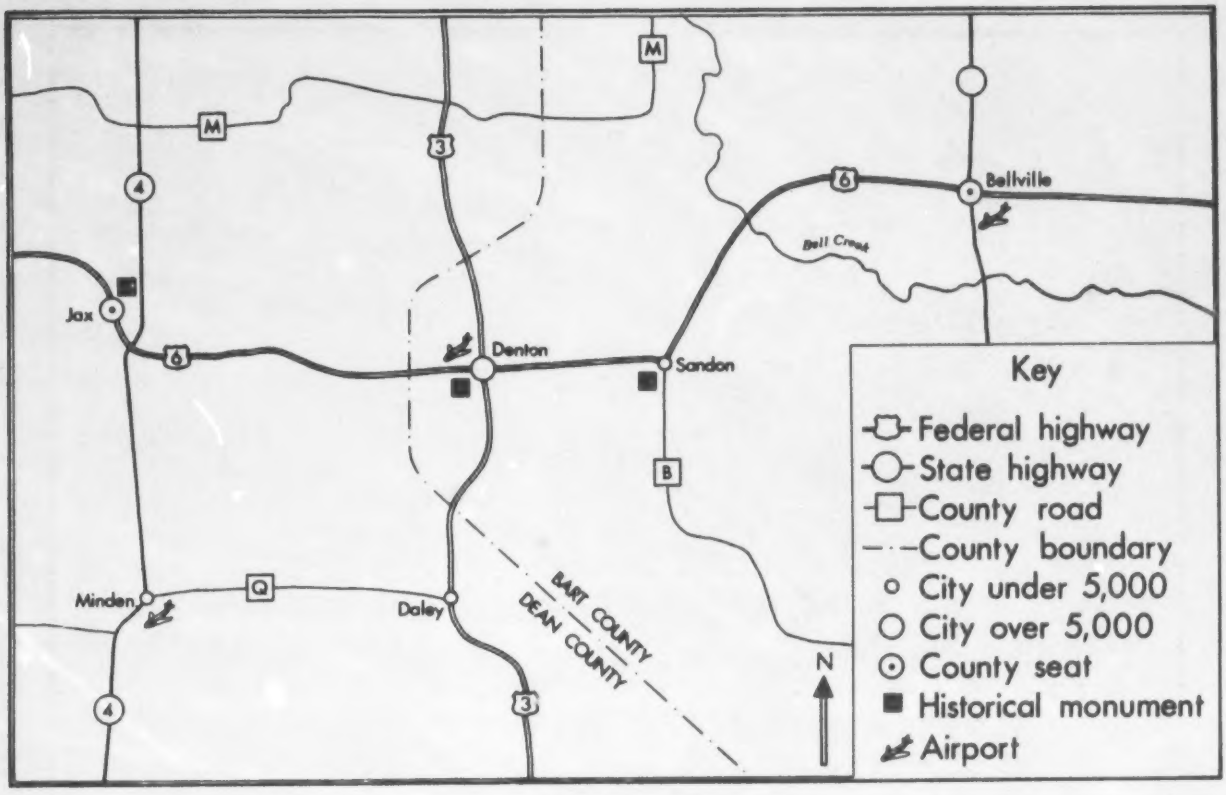

1. Which county is Bell Creek in? _____
2. What is the county seat of Dean County? _____
3. What kind of road goes between Minden and Daley? _____
4. Which county seat has an airport? _____
5. Which city under 5,000 has a historical monument? _____
6. Which city under 5,000 has an airport? _____
7. Which two roads would you take to go from Daley to Sandon? _____
8. Which city over 5,000 has a historical monument and an airport? _____
9. Which federal highway goes north and south? _____

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APPENDIX D

ACTIVITY CHECK TEST

ACTIVITY CHECK SHEET

Name _____

INTRODUCTORY ACTIVITIES

	Date Started	Date Finished
I-1		
I-2		
I-3		
I-4		
I-5		
I-6		
I-7		

LEVEL C ACTIVITIES

	Date Started	Date Finished
C-1		
C-2		
C-3		
C-4		
C-5		

LEVEL D ACTIVITIES

	Date Started	Date Finished
D-1		
D-2		
D-3		
D-4		
D-5		

LEVEL E ACTIVITIES

	Date Started	Date Finished
E-1		
E-2		
E-3		
E-4		
E-5		
E-6		